TWR-18894

SPACE SHUTTLE

Solid Rocket Motors
Thiokol Corporation

Generic System Components of the Thiokol Ultrasonic RSRM Case-to-Insulation Bondline Inspection System Final Test Report

25 July 1989

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Marshall Space Flight Center, Alabama 35812

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Thiokol CORPORATION
SPACE OPERATIONS

P.O. Box 707, Brigham City, UT 84302-0707 (801) 863-3511

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Generic System Components of the Thiokol Ultrasonic RSRM Case-to-Insulation Bondline Inspection System Final Test Report

Test Planning and Reporting

Approved by:

Requirements and Certification Manager

Project Engineer Support Equipment

Program Manager Support Equipment

Reliability 18 July 89

System Safety

PC Tydeck 7-18-89
Data Management
ECS# SS2412

ABSTRACT

Qualification testing of the Ultrasonic Redesigned Solid Rocket Motor Bondline Inspection Systems (URBIS) was conducted at the Thiokol Nondestructive Evaluation Test Facility M337A and at the Rotation Process Storage Facility at Kennedy Space Center. The test was performed on portions of the URBIS that are generic to redesigned solid rocket motor case-to-insulation bondline inspections. Testing began on 13 Feb 1989 and was completed on 26 May 1989.

The main purpose of the test was to verify that each URBIS performed to the manufacturer's specifications in the same manner and to make any procedural changes necessary for specific redesigned solid rocket motor inspections. All five URBISs passed every stage of the qualification test. Each URBIS has now been qualified for use on redesigned solid rocket motors, and verifying that each URBIS obtained and analyzed data in a similar fashion has eliminated concerns about variations in data between the five systems.

The following recommendations have been made as a result of this test: 1) Each URBIS should be located within a stable environment. 2) An electronic preventative maintenance program should be established for each URBIS. 3) When the URBIS is being utilized to perform transducer analysis, the URBIS equipment setting should match the equipment setting noted on the manufacturer-supplied transducer certification sheet. 4) Optimum scan velocities for each inspection technique (clevis, capture feature, pinhole and membrane) should be determined through further testing.

CONTENTS

FIGURES

ACRONYMS AND ABBREVIATIONS

AD	analog-digital
CRT	cathode-ray tube
dc	direct current
EMI	electromagnetic interference
GHz	gigahertz
kHz	kilohertz
MHz	megahertz
NDE	nondestructive evaluation
PM	preventive maintenance
RF	radio frequency
RPSF	Rotation Process Storage Facility
RSRM . . .	redesigned solid rocket motor
TPS	test preparation sheet
URBIS . . .	Ultrasonic RSRM Bondline Inspection System
VIP	volumetric inspection system

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INTRODUCTION

This report presents the procedures, performance, and results of the qualification tests for the portions of Combustion Engineering's AMDATA Intraspect/98 Data Acquisition and Imaging System that are generic to redesigned solid rocket motor (RSRM) case-to-insulation bondline inspections. The Intraspect/98 system will be referred to as the Thiokol Ultrasonic RSRM Bondline Inspection System (URBIS) (C77-0479). The four bondline inspections are applied to the capture feature, clevis, pinholes, and membrane. The purpose of the URBIS is to execute scan sequences, gather and analyze data, and archive the data. Ultrasonic inspections specific to the capture feature, clevis, pinholes, and membrane will be qualified in the future per their own tests.

The test focused only on the performance of URBIS components that were independent of specific RSRM inspections. The qualification of each URBIS began with documentation of the calibration and checkout of the major URBIS components by Combustion Engineering personnel prior to Thiokol's receiving the URBIS. A recalibration and checkout by Thiokol Electronic Maintenance personnel was performed just prior to the qualification test. The qualification functional checks were then performed on the system, ultrasonic, mechanical, and computer portions of the system.

Testing was conducted in accordance with CTP-0100, "Qualification Test Plan For The Generic System Components Of The MTI Ultrasonic RSRM Bondline Inspection System (URBIS)." The objectives and procedures of CTP-0100 were derived from AMDATA manuals and specifications (referenced in Section 7.0, Applicable Documents). Testing was performed to ensure that each URBIS performed to the manufacturer-specified requirements and to note any changes needed for specific RSRM applications. It is recommended that CTP-0100 and the AMDATA manuals and specifications be referred to for further explanation of URBIS components and test procedures.

Five complete URBIS systems were qualified: 1) Thiokol Nondestructive Evaluation (NDE) Lab Inspection System (S/N S-A51866), 2) Thiokol RSRM Insulated Level Inspection System (S/N S-A51868), 3 and 4) Thiokol Final Assembly Loaded Level Inspection System (S/Ns S-A51865 and S-A51869), and 5) KSC Loaded Level Inspection System (P/N 2U129431-001).

The prequalification recalibration and checkout was performed at the Thiokol Electronic Maintenance Facility M-71 and at the Kennedy Space Center (KSC) Rotation Process Storage Facility (RPSF). The qualification testing was conducted at the Thiokol NDE Test Facility M337A and at the RPSF. Testing began on 13 Feb 1989 and was completed on 26 May 1989.

1.1 TEST ARTICLE DESCRIPTION

Test article configuration was controlled by applicable AMDATA drawings and CTP-0100. The URBIS (Amdata Intraspect/98 Data Acquisition and Imaging System) (Figures 1 through 3) consists of:

- Hewlett Packard 9836CS computer, color monitor and hard disk printers
- Amdata's volumetric inspection system (VIP) software
- Remote data acquisition system (RDAS)
- Motion or scan controller (SC5032)
- Remote pulser-preamplifier (RPP5RT)
- AMAPS scanner (Model 2090)
- Remote receiver (RR4RT)
- Topaz uninterruptable power supply (UPS)
- Couplant supply system (Model 1010)
- 250-ft umbilical cable
- Communication set
- Membrane scanner

In addition to the URBIS components and associated test instrumentation (listed in Section 4.0), a 12- by 18-in. case/insulation sample was used for the electromagnetic interference (EMI) and later tests. Also, a Parker Contour Probe (Model DA-400) was used to impose extreme EMI levels on the data acquisition cables.

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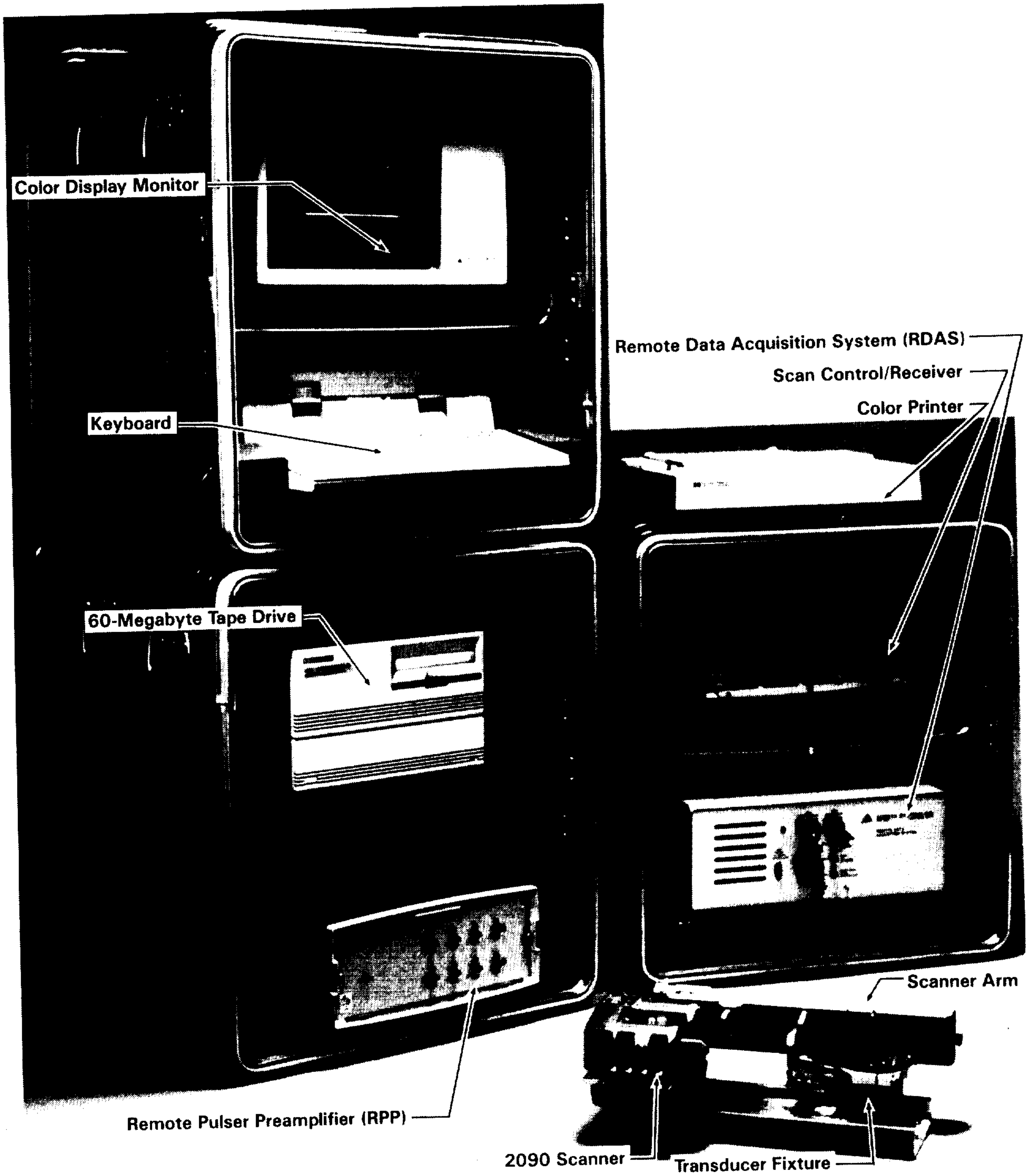

Figure 1. Ultrasonic RSRM Bondline Inspection System (URBIS)

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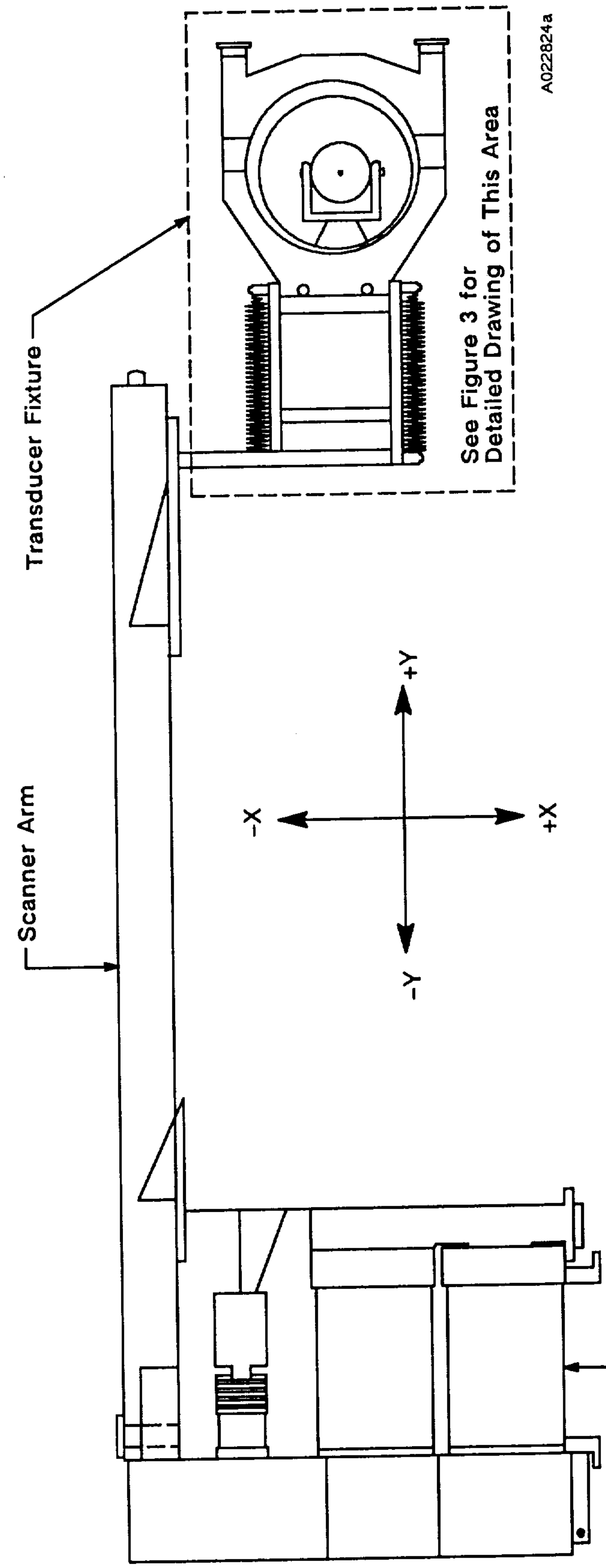

Figure 2. AMAPS 2090 Scanner Assembly (top view—not to scale)

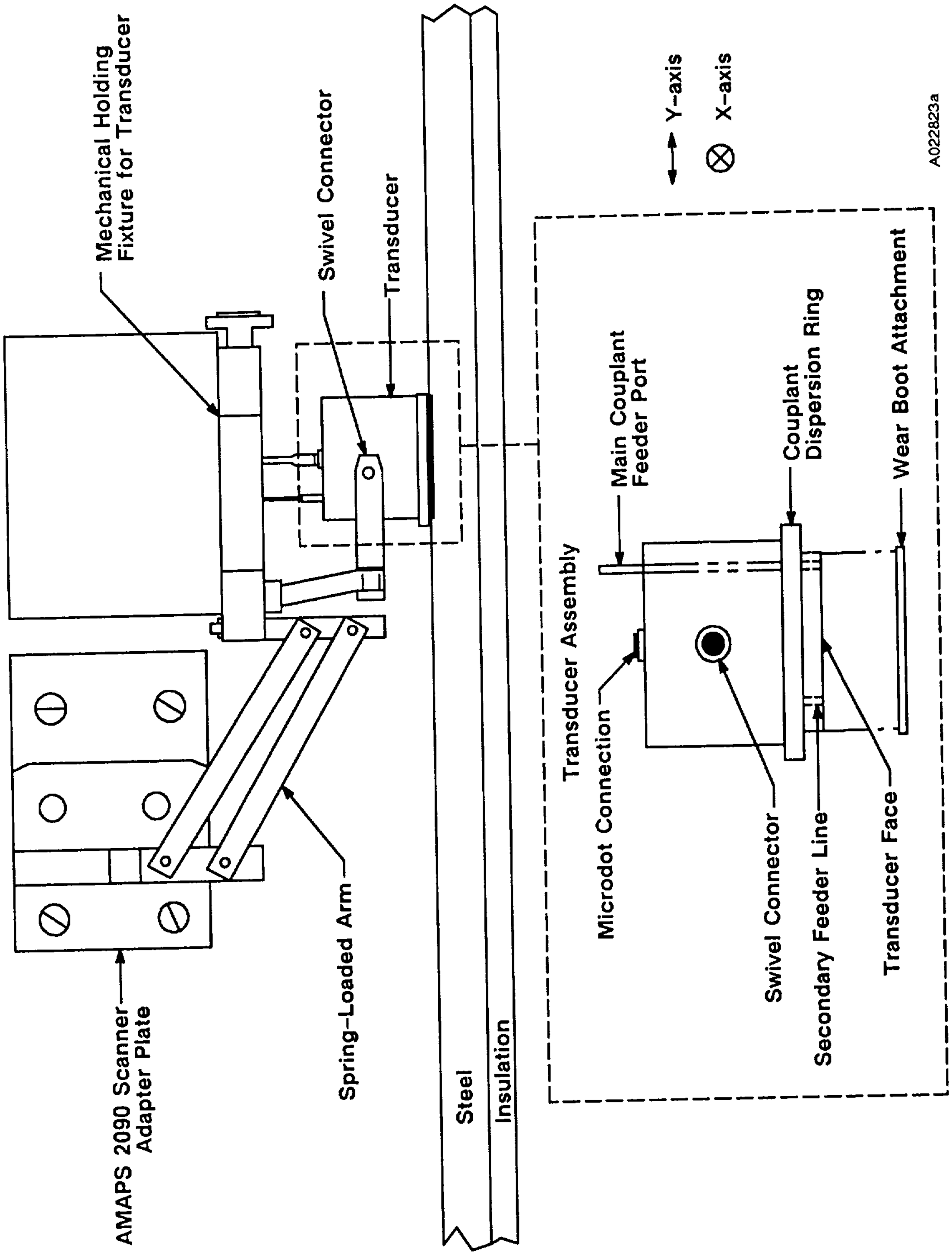

Figure 3. AMAPS 2090 Scanner—Transducer Fixture for RSRM Membrane Scanning (side view)

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OBJECTIVES

The following test objectives were derived from AMDATA manuals and specifications referenced in Section 7.0, Applicable Documents.

A. Verify that the system components perform as specified by the vendor.

B. Verify that the band pass filters, generic transducer analysis software, and analog-digital (AD) converter are working properly as well as the shielding of the data acquisition cables against EMI.

C. Verify that the Y-axis transducer positions accurately.

D. Verify that the X-axis transducer positions accurately.

E. Verify that the manufacturer-specified Y-axis scan velocity allows data to be digitized and displayed in both the peak detection and radio frequency (RF) modes.

F. Verify that the manufacturer-specified X-axis scan velocity allows data to be digitized and displayed in both the peak detection and RF modes.

G. Verify that, in the event of a power failure, the URBIS will provide the operator with enough time to shut down a scan and store all data that had been accumulated up to the point of the power failure.

H. Verify cathode-ray tube (CRT) color scale accuracy and display clarity.

I. Verify that the color scale presentation on the CRT is the same as the colors produced on the printer.

J. Verify that data file transfers from the URBIS hard disk to the data tape cartridge and then back do not compromise the data. (This additional objective was added by nondestructive engineering after the completion of CTP-0100.)

3

EXECUTIVE SUMMARY

3.1 SUMMARY

This section contains an executive summary of the key results from test data evaluation. Additional information and details can be found in Section 6, Results and Discussion.

Qualifying the generic components of the five URBISs consisted of two major efforts: 1) a prequalification electronic and mechanical maintenance/recalibration, and 2) a series of qualification tests to check out the electrical, mechanical, and software limitations of each system. Except where testing was unique to RSRM hardware, all testing was performed to baseline inspection procedures (per CTP-0100) from the manufacturer and vendor, Combustion Engineering.

Operating instructions from the manufacturer were for more simplified inspections than for the RSRM. Testing determined that these operating procedures required some alterations to allow for RSRM compatibility; the most significant change was to the scan velocity. The manufacturer recommends one scan velocity for all inspections, but it was determined that different scan velocities are necessary for each type of RSRM scan. A minimum scan velocity for all RSRM inspections was obtained during this test.

The main purpose of the test was to verify that each URBIS performed to the manufacturer's specifications in the same manner and to make any procedural changes necessary for specific RSRM inspections. Each URBIS passed every stage of the qualification test, and the results from all tests were very encouraging. Each URBIS has now been qualified for use on RSRMs, and verifying that each URBIS obtained and analyzed data in a similar fashion has eliminated concerns about variations in data between the five systems. This test also provided many insights into other areas of concern such as the URBIS working environment, preventative maintenance, and matching of equipment.

3.2 CONCLUSIONS

The following columns list the conclusions as they relate specifically to the objectives. Additional information to support each objective and conclusion can be found in Section 6.2, Test Description, Results, and Discussion.

Objective	Conclusion
A. Verify that the system components perform as specified by the manufacturer.	Verified. Each URBIS passed the system diagnostic self-test, which verified that each component was properly configured and properly interfaced with all other components. Each URBIS also passed the system validation test, which verified that all parameters that could affect data interpretation were within tolerance.
B. Verify that the band pass filters, generic transducer analysis software, and AD converter are working properly, as well as the shielding of the data acquisition cables against EMI.	Verified in each case: The band pass filters for each URBIS performed per manufacturer specifications, allowing only waveforms within specific frequencies to be displayed. The generic transducer analysis software for each URBIS performed per manufacturer specifications. It was verified that the data sampling rate should be at least four times the specified frequency for each particular transducer. Each URBIS successfully completed the analog/digital converter verification test, which determined the maximum amount of data that could be digitized at various scan speeds. All URBIS shielded data acquisition cables withstood manufacturer-specified EMI limits with no degradation in performance. A magnetic probe was used to subject cabling to intense EMI fields.
C. Verify that the Y-axis transducer positions accurately.	Verified. The Y-axis accuracy of each URBIS transducer was within manufacturer-specified limits.
D. Verify that the X-axis transducer positions accurately.	Verified. The X-axis positioning accuracy of each URBIS transducer was within manufacturer-specified limits.
E. Verify that the manufacturer-specified Y-axis scan velocity allows data to be digitized and displayed in both the peak detection and RF modes.	Initial attempts to obtain data using the manufacturer-specified scan velocity (4.0 in./sec) failed for both the peak detect and RF mode tests. It became evident that RSRM hardware differs significantly from hardware that was used to obtain the vendor-specified scan velocity. New scan velocities were tried, and each URBIS then passed testing. It was determined that a maximum, reliable scan velocity of 2.5 in./sec should be used simultaneously in both the X and Y directions. Scan velocity should be lowered as the amount of data retrieval increases.

Objective	Conclusion
F. Verify that the manufacturer-specified X-axis scan velocity allows data to be digitized and displayed in both the peak detection and RF modes.	Initial attempts to obtain data using the manufacturer-specified scan velocity (4.0 in./sec) failed for both the peak detect and RF mode tests. It became evident that RSRM hardware differs significantly from hardware that was used to obtain the vendor-specified scan velocity. New scan velocities were tried, and each URBIS then passed testing. It was determined that a maximum, reliable scan velocity of 2.5 in./sec should be used simultaneously in both the X and Y directions. Scan velocity should be lowered as the amount of data retrieval increases.
G. Verify that, in the event of a power failure, the URBIS will provide the operator with enough time to shut down a scan and store all data that had been accumulated up to the point of the power failure.	Verified. Each URBIS performed and passed the uninterruptable power supply tests as specified by the manufacturer.
H. Verify CRT color scale accuracy and display clarity.	Verified. The CRT display clarity and color were within manufacturer-specified parameters.
I. Verify that the color scale presentation on the CRT is the same as the colors produced on the printer.	Verified. The CRT and printer hard copy display clarity and color matched and were within manufacturer-specified parameters.

Additional Objective	Conclusion
J. Verify that data file transfers from the URBIS hard disk to the data tape cartridge and then back do not compromise the data. (This additional objective was added by nondestructive engineering after the completion of CTP-0100.)	Verified. Each URBIS performed and passed the data file integrity verification test with no degradation to the data.

3.3 RECOMMENDATIONS

As a result of the generic system components of the URBIS qualification test, the following recommendations have been made:

1. Each URBIS should be located within a stable environment. Erratic fluctuations in temperature and/or humidity will degrade URBIS performance. Although each URBIS qualification test was performed in an environmentally controlled laboratory, systems in use (particularly at Thiokol Final Assembly) have experienced output problems due to heat. Because the URBIS generates large amounts of heat, ambient temperature should be 75° ±5°F, and relative humidity should be less than 60 percent. All URBIS components should be positioned to allow maximum air circulation and ventilation.

2. An electronic preventative maintenance (PM) program should be established for each URBIS. This program would require that each URBIS be routinely checked after every 125 hr of operation or every 6 months, whichever comes first. The PM would follow the manufacturer's suggested maintenance procedures (identical to the prequalification procedures), which include electronic recalibration, hardware cleaning, and inspecting for wear.

3. When the URBIS is being utilized to perform transducer analysis, the URBIS equipment setting should match the equipment setting noted on the manufacturer-supplied transducer certification sheet. The manufacturer-provided URBIS aluminum reference standard shall be used during transducer analysis. The first full backwall reflection from the reference standard shall be used in the analysis. The analysis should not contain more than five half-cycles of the backwall reflection. Unless otherwise specified, the URBIS shall digitize the signal at a sampling rate of at least four times the specified frequency of the transducer. The primary pulse width shall be the inverse of two times the resonant frequency of the transducer. The pulse width shall then be adjusted to obtain the highest amplitude response. Also, all transducers should be recertified at least every six months, depending on use.

4. Optimum scan velocities for each inspection technique (clevis, capture feature, pinhole and membrane) need to be determined. The amount of data taken and the component velocities for the X and Y axes govern optimum scan velocities. NDE design engineering is currently working to obtain these optimum scanning velocities.

4

INSTRUMENTATION

Test instruments were electrically zeroed and calibrated in accordance with MIL-STD-45662. In addition to the URBIS, the following equipment was used during testing:

Instrumentation	Measurement Type
MetroTek, Inc. 5406 Immersion Tank	Generic transducer analysis software verification
Marconi Instruments 10 kHz-1 GHz Signal Generator, 2022C	Band pass filter verification
Tektronix SC 504 Oscilloscope	Band pass filter verification, electronic maintenance
AMDATA Aluminum Reference Standard	System validation, generic transducer analysis software verification
Hewlett Packard 9000 Terminal	Electronic maintenance
Fluke 8025B Multimeter	Electronic maintenance
AMDATA DTM-98 (Diagnostic Test Module)	Electronic maintenance and calibration
Hewlett Packard 3468A RF Voltmeter	Electronic maintenance
11096B High-Frequency Probe	Electronic maintenance

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PHOTOGRAPHY

Still color photographs of the test setup were taken. Copies of the photographs taken (negative series 111325) are available from the Thiokol photographic services department.

6

RESULTS AND DISCUSSION

Testing was conducted in accordance with CTP-0100, "Qualification Test Plan For The Generic System Components Of The MTI Ultrasonic RSRM Bondline Inspection System (URBIS)." The test procedures of CTP-0100 were derived from AMDATA manuals and specifications (referenced in Section 7.0, Applicable Documents). It is recommended that CTP-0100 and the AMDATA manuals and specifications be referred to for further explanation of URBIS components and test procedures.

6.1 TEST ARTICLE ASSEMBLY

Each URBIS was delivered from the vendor/manufacturer with the components listed in Section 1.1, Test Article Description. URBIS assembly was not required prior to testing. Each URBIS remained as a single unit; no interchanging of components occurred.

6.2 TEST DESCRIPTION, RESULTS, AND DISCUSSION

Five complete URBIS systems were qualified: 1) Thiokol NDE Lab Inspection System (S/N S-A51866), 2) Thiokol RSRM Insulated Level Inspection System (S/N S-A51868), 3 and 4) Thiokol Final Assembly Loaded Level Inspection System (S/Ns S-A51865 and S-A51869), and 5) KSC Loaded Level Inspection System (P/N 2U129431-001).

The qualification of each URBIS included documentation of the calibration and checkout of the major URBIS components by Combustion Engineering personnel prior to Thiokol's receiving of the URBIS, and then a recalibration and checkout by Thiokol's Electronic Maintenance personnel prior to the qualification test.

Testing at KSC was performed per a test preparation sheet (TPS) (per NASA requirements for ground support equipment) instead of directly following CTP-0100. The TPS outlined the same procedures as CTP-0100, and the post-test TPS is included in Appendix A. Thiokol Electronic Maintenance and NDE design engineering personnel were sent to KSC to perform that portion of URBIS qualification at the RPSF.

Each URBIS at Thiokol's Space Operations was individually rotated off the production line for qualification testing. These URBISs were delivered to the Electronic Maintenance Facility M-71 for prequalification electronic and mechanical maintenance/recalibration and then transferred to the NDE lab M-337A for qualification testing. Results of the four URBIS tests performed at Space Operations are included in Appendix B.

A summary of each test, as applied to each URBIS, follows:

6.2.1 System Diagnostic Test. (Appendix B, Form A)

Each URBIS passed the system diagnostic self-test as specified in AMDATA engineering specification No. 870128, Section 3.0. The self-test verified that each URBIS component was properly configured and interfaced with all other URBIS components.

6.2.2 System Validation Test. (Appendix B, Form B)

Each URBIS passed the system validation test as specified in AMDATA engineering specification No. 870128, Section 3.0. The system validation tests were performed on the manufacturer-supplied aluminum reference standard. These tests verified that all parameters which could affect data interpretation were within tolerance. The major system validation tests performed were system gain repeatability, distance amplitude correction, time-of-flight software, system noise level, and transient response.

6.2.3 Ultrasonic Electronic Functional Tests

6.2.3.1 Band Pass Filter Verification Test. (Appendix A, TPS Item 2.0; Appendix B, Form C). The band pass filters for each URBIS performed per manufacturer specifications, allowing only wave forms within specific frequencies to be displayed. A sine wave was sent from a Marconi Instruments Signal Generator (Model 2022C) into each URBIS receiver unit; the wave was then digitized and real-time displayed. Each band pass filter was individually activated. The frequency of the input signal was increased from just below the band pass filter's specified frequency to a frequency well above the specified frequency. The amplitude of the sine wave versus each specific input frequency was then recorded. Three band-pass filters were tested: a 0.5-MHz high-pass filter, a 4.0-MHz low-pass filter, and an 8.0-MHz low-pass filter.

6.2.3.2 Analog/Digital Converter Verification Test. (Appendix A, TPS Item 3.0; Appendix B, Form D). Each URBIS successfully completed the analog/digital converter verification test per manufacturer specifications. This test determined the maximum amount of data that could be digitized at various scan speeds and A-gate widths. (The A-gate determines the amount of data to be digitized.)

6.2.3.3 Generic Transducer Analysis Software Verification Test. (Appendix A, TPS Item 4.0; Appendix B, Form E). The generic transducer analysis software for each URBIS performed per manufacturer specifications (Figures 4 and 5). It was verified that the data sampling rate should be at least four times the manufacturer-specified frequency for each particular transducer. This test also utilized the manufacturer-supplied aluminum reference standard to obtain the required signal response. It is essential that the URBIS equipment be set up to match the parameters of the particular transducer equipment; otherwise, the data received will not match the original transducer data. Transducer parameters are listed on each transducer's certification sheet.

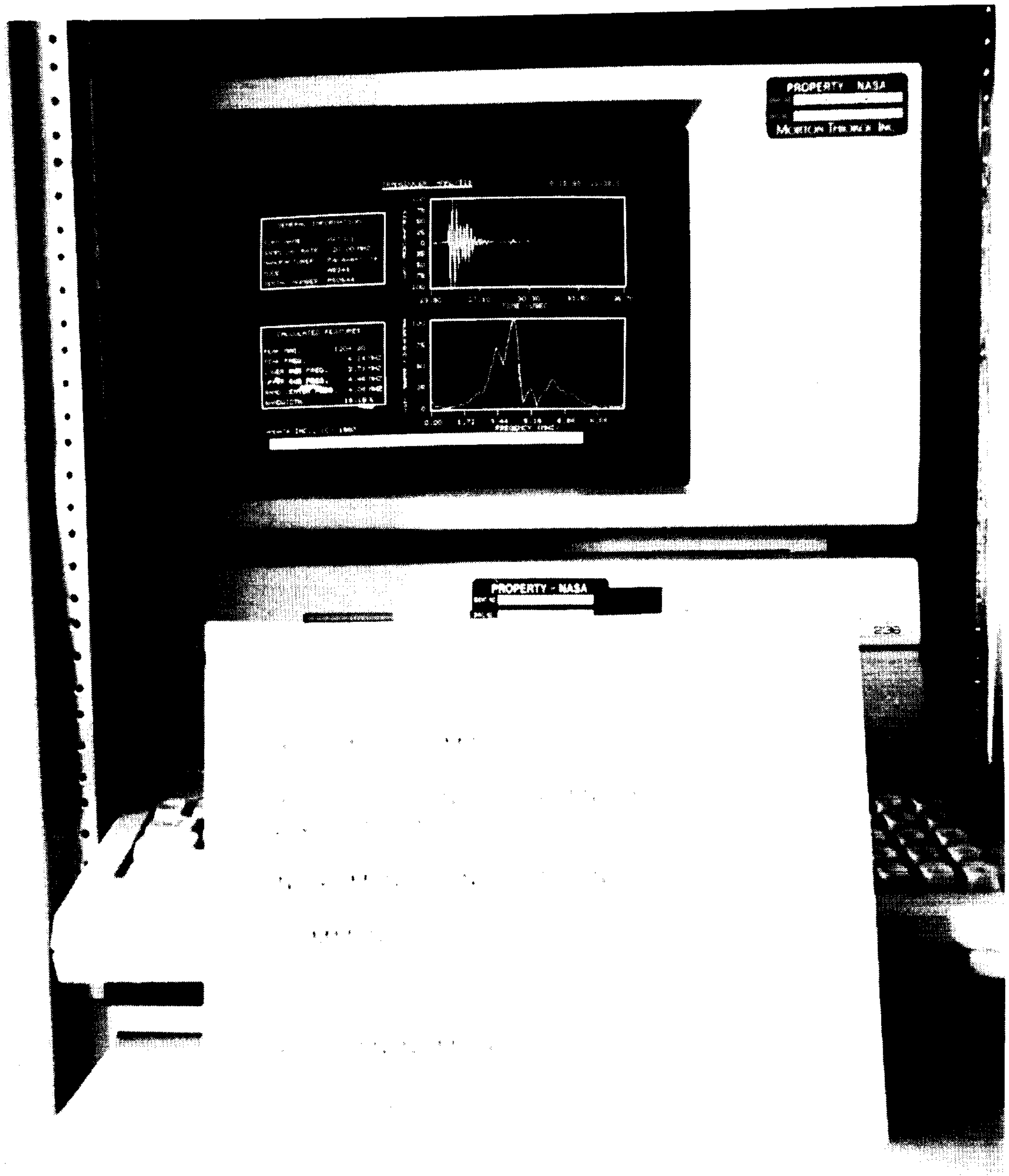

Figure 4. URBIS Generic Transducer Analysis Software Verification Test—Screen Presentation

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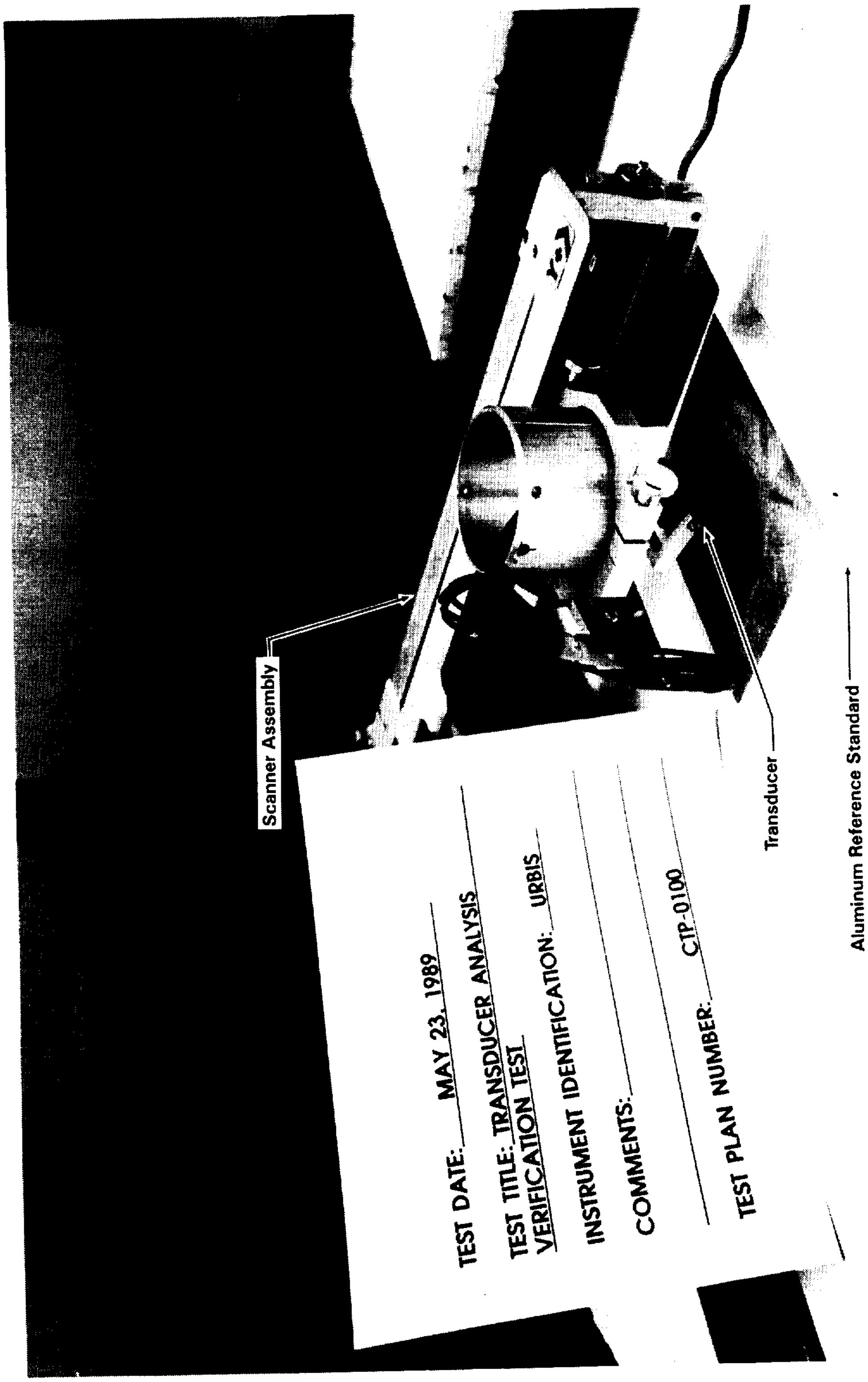

Figure 5. URBIS Generic Transducer Analysis Software Verification Test—Scanner Assembly

6.2.3.4 Shielded Data Acquisition Cable EMI Test. (Appendix A, TPS Item 5.0; Appendix B, Form F). All shielded data acquisition cables withstood manufacturer-specified EMI limits with no degradation in performance. In order to subject each URBIS to a more intense EMI field than the worst-case field existing in proximity to the M-111 autoclave, a Parker Contour Probe (Model DA-400) was used (Figure 6). To assure maximum EMI penetration, the magnetic probe was used in the dc mode. Flux density was approximately 68,000 lines of flux per in.^{2} at 4-in. pole spacing.

6.2.4 Mechanical Functional Tests

6.2.4.1 Y-Axis Transducer Positioning Accuracy Test. (Appendix A, TPS Item 6.0; Appendix B, Form G). Y-axis positioning accuracy of each URBIS transducer was within manufacturer-specified limits. Because large regions on the RSRM are scanned at one time, positioning accuracy is essential. The ability to return to an unbond and measure its size is a necessity. This test verified that each URBIS has this capability.

6.2.4.2 X-Axis Transducer Positioning Accuracy Test. (Appendix A, TPS Item 7.0; Appendix B, Form H). X-axis positioning accuracy of each URBIS transducer was within manufacturer-specified limits. Because large regions on the RSRM are scanned at one time, positioning accuracy is essential. The ability to return to an unbond and measure its size is a necessity. This test verified that each URBIS has this capability.

6.2.4.3 Y-Axis Scan Velocity Test. (Appendix A, TPS Item 8.0; Appendix B, Form I). Initial attempts to obtain data using the vendor-specified scan velocity (4.0 in./sec) failed for both the peak detect and RF mode tests. It became evident (through discussions with the manufacturer) that RSRM hardware differs significantly from hardware that was used to obtain the manufacturer-specified scan velocity. New scan velocities were tried, and each URBIS then passed testing. It was determined that a maximum reliable scan velocity of 2.5 in./sec should be used simultaneously in both the X and Y directions. Scan velocity should be lowered as the amount of data retrieval increases.

6.2.4.4 X-Axis Scan Velocity Test. (Appendix A, TPS Item 9.0; Appendix B, Form J). Initial attempts to obtain data using the vendor-specified scan velocity (4.0 in./sec) failed for both the peak detect and RF mode tests. It became evident (through discussions with the manufacturer) that RSRM hardware differs significantly from hardware that was used to obtain the vendor-specified scan velocity. New scan velocities were tried, and each URBIS then passed testing. It was determined that a maximum reliable scan velocity of 2.5 in./sec should be used simultaneously in both the X and Y directions. Scan velocity should be lowered as the amount of data retrieval increases.

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Figure 6. EMI Test on URBIS Data Acquisition Cable

6.2.5 Computer Systems Functional Tests

6.2.5.1 Uninterruptable Power Supply Test. (Appendix A, TPS Item 10.0; Appendix B, Form K). Each URBIS performed and passed the uninterruptable power supply tests as specified in AMDATA engineering specification No. 870128, p 73. The purpose of this test was to verify that, if facility power was lost during scanning operations, the uninterruptable power supply would provide enough electricity to allow for data storage and equipment shutdown.

6.2.5.2 CRT Display and Hard Copy Accuracy Test. (Appendix A, TPS Item 11.0; Appendix B, Form L). Each URBIS completed the CRT display and hard copy test within the manufacturer-specified parameters. Because analysis of the RSRM case-to-insulation bondline requires color scale use on both URBIS CRTs and hardcopy printouts, display clarity and color scale accuracy are essential. The CRT and hardcopy display clarity and color were also verified against the manufacturer specifications.

6.2.5.3 Data File Integrity Verification Test. (Appendix A, TPS Item 12.0; Appendix B, Form M). Each URBIS performed and passed the data file integrity verification test with no degradation to the data. This test determined if data file transfers from the URBIS hard disk to the data tape and then back compromised the data.

7

APPLICABLE DOCUMENTS

Document No.	Title
CTP-0100	Qualification Test Plan For The Generic System Components OF The MTI Ultrasonic RSRM Bondline Inspection System (URBIS)

Military Standard	Title
MIL-STD-45662	Calibration System Requirements

Manuals	Title
88177	Ultrasonic Testing Training Manual
841812	AMAPS 2090 Scanner Operating Instructions (AMDATA engineering specification)
841224	Quality Test Procedure for AMAPS 2090 Scanner (AMDATA engineering specification)
850108	RDAS Calibration Procedure, Appendix A (AMDATA engineering specification)
850201	Remote Pulser/Preamplifier Operating Manual (AMDATA engineering specification)
850202	Remote Receiver (RR4RT) Operating Manual (AMDATA engineering specification)
850923	Remote Pulser Preamplifier (RPP4RT) Calibration and Certification Procedure (AMDATA engineering specification)
860121	Skewing System Operating Manual (AMDATA engineering specification)
870128	Intraspect/98 Volumetric Inspection System (VIP) Operating Manual (AMDATA engineering specification)
870819	RF Receiver Calibration Procedure (AMDATA engineering specification)
871231	Model 1010 Couplant Supply System Operating Manual (AMDATA engineering specification)
EQ076	Topaz-Uninterruptable Power Source (AMDATA engineering specification)

Appendix A

TEST PREPARATION SHEET AND RESULTS FOR THE ULTRASONIC QUALIFICATION TEST AT KSC

(includes AMDATA engineering specification No. 870128, "Intraspect/98 VIP Operating Manual")

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NASA USAF
Kennedy Space Center/Vandenberg Air Force Base

TEST PREPARATION SHEET

ADDED MOD CCI

CONTROL NO.	[illegible]
TPS NO.	
TPS NO.	[illegible]-00-001-[illegible]
TPS NO.	
TPS NO.	
TPS NO.	

TYPE			
A	CONFIGURATION CHANGE		PAGE 1 OF 25
B	NON-CONFIGURATION	X	MOD SHEET NUMBER

TPS SHORT TITLE/REASON
ULTRASONIC QUALIFICATION TEST

PREPARED BY	ORG.	EXT.	DATE	CONSTRAINT/NEED DATE
J. YUN/ J. PICO	THI-QE	5251	4/2/89	NONE

DRAWING(S) DOCUMENTS
N/A

	YES	NO
SAFETY HAZARD	☐	☒
LIMITED LIFE EQUIP.	☐	☒
WEIGHT REQUIRED	☐	☒
MATERIAL ENGINEER SIGNATURE	☐	☒
RETEST REQUIRED	☐	☒

RETEST PER

CRITICAL SKILLS REQUIRED ☒ YES ☐ NO

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
	GS 49 QE 086 SPC 4/10/89			
	THE PURPOSE OF THIS TPS IS TO VERIFY THAT THE I-89 ULTRASONIC TEST EQUIPMENT PERFORMS AS SPECIFIED BY THE VENDOR.			
1.0	INFORMATION:			
1.1	REFERENCED INSTRUCTIONS: N/A			
1.2	COMPUTER SYSTEMS: N/A			
1.3	SPECIAL TOOLS, EQUIPMENT AND MATERIALS:			
	MARCONI INSTRUMENT ---------------------------- 1 EA			
	10 kHz SIGNAL GENERATOR 2022C SN. U-B03348 ----- 1 EA			
	AMDATA MEMBRANE SCANNER W/ARM ----------------- 1 EA			
	5 MHz TRANSDUCER SN. S-A5184808 ---------------- 1 EA			
	STEEL/RUBBER MEMBRANE SAMPLE ------------------- 1 EA			

PARTS WEIGHT RECORDED	DATE	FINAL ACCEPTANCE	CONTR.	GOVT.	DATE

APPROVALS – REFER TO LOCAL PROCEDURES

NAME	ORG.	DATE	NAME	ORG.	DATE
1 Janet A. Yun QE 086 SPC	THI-QE	APR 10 '89	1 Robert Patterson GS 49	THI-GSE	APR 12 '89
2 [signature]	Thi LSS	APR 11 '89	2		
3 Bruce Hardon	TV-MSO-24	12 APR 89	3		

KSC FORM 4-124E (REV. 3/88)

PLEASE PRESS HARD! BOTTOM COPY MUST BE READABLE!

NASA USAF
Kennedy Space Center/Vandenberg Air Force Base

TEST PREPARATION SHEET
~~(CONTINUATION)~~
Mod Index

PAGE 1A OF
MOD SHEET NO.
CONTROL NO. 4A156
TPS NO. C77-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
001	MOD ADDED TO TPS (SPC 1000) APR 13 '89			

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE

APPROVALS – REFER TO LOCAL PROCEDURES

NAME	ORG	DATE	NAME	ORG	DATE
1			1		
2			2		

KSC FORM 4-124A (REV. 7/82)

PLEASE PRESS HARD! BOTTOM COPY MUST BE READABLE!

NASA — National Aeronautics and Space Administration | USAF — Department of the Air Force, United States of America

Kennedy Space Center/Vandenberg Air Force Base

TEST PREPARATION SHEET

CONTROL NO. 4A156

TPS NO. C77-0479-00-001-0005

TPS NO.

TPS NO.

TPS NO.

TPS NO.

TYPE: A — CONFIGURATION CHANGE; B — NON-CONFIGURATION X

PAGE 1 OF 1

MOD SHEET NUMBER 001

TPS SHORT TITLE/REASON: ULTRASONIC QUALIFICATION TEST

PREPARED BY: BOB PATTISON ORG.: THI-GSE EXT.: 6884 DATE:

CONSTRAINT/NEED DATE: NONE

DRAWING(S) DOCUMENTS

SAFETY HAZARD ☐ YES ☑ NO

LIMITED LIFE EQUIP. ☐ YES ☑ NO

WEIGHT REQUIRED ☐ YES ☑ NO

MATERIAL ENGINEER SIGNATURE ☐ YES ☑ NO

RETEST REQUIRED ☐ YES ☑ NO

RETEST PER

CRITICAL SKILLS REQUIRED ☐ YES ☑ NO

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
	THIS MOD DOES NOT CHANGE THE INTENT OF THE BASIC TPS NOR DOES IT INCREASE THE HAZARD LEVEL.			
1.0	DELETE SEQUENCE 3.1 AND 14.0 WITH VERIFY CSR 028.	Q		
2.0	CLOSE THIS MOD	Q		

PARTS WEIGHT RECORDED | DATE | FINAL ACCEPTANCE | CONTR. | GOVT. | DATE

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG.	DATE		NAME	ORG.	DATE
1	Robert Pattison GS 49	THI GSE	13 APR 89	1			
2	Janet Yun QE 086 SPC	THI-QE	4/13/89	2			
3	Bruce Hardman	TV-MSD-24	4/13/89	3			

KSC FORM 4-124 (REV. 7/82)

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

PAGE [illegible] OF 25	
MOD SHEET NO.	
CONTROL NO.	1A156
TPS NO.	[illegible]-00-001-00[illegible]

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
1.4	SUPPORT TOOLS, EQUIPMENT AND MATERIALS: 12 in. Scale divided in 0.1 in. Hex Wrench 9/64 in.			
1.5	CRITICAL SKILLS: ~~N/A~~ 4/10/89 QE 086 SPC GS 49 CSR-028: ELECTRICAL CONNECTOR MATE/DEMATE			
1.6	SAFETY REQIREMENTS: N/A			
1.7	SPECIAL INSTRUCTIONS: Steps may be worked out of sequence per QC direction. FIGURES 1-4 SHOWN FOR TEST SET-UP. 4/10/89 QE 086 SPC GS 49			
1.8	OMPS REQUIREMENTS SATISFIED BY THIS TPS: N/A			

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. [illegible] / J. [illegible]	THI-QE	6251	4-0[illegible]-89				

APPROVALS PER LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-[illegible]	11 Apr 89
2	Bruce [illegible]	[illegible]-MSD-29	APR [illegible] '89	2	QE 086 SPC	THI-[illegible]	APR 10 '89

KSC FORM 4-124D (REV. 7/86)

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

PAGE OF 25
MOD SHEET NO.
CONTROL NO. 1A156
TPS NO. [illegible]

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
2.0	VERIFICATION OF BAND PASS FILTERS: GS 49 QE 086 SPC 4/11/89 VERIFY CSR-028		Q SPC 477	
2.1	Connect the Marconi Instruments, 2022D Wave Form Generator to the Remote Pulser Preamplifier (RPP) in the Channel 1 Receive port. Turn the power on.		Q SPC 477	
2.2	Place the URBIS in the Pitch-Catch mode (Page 5-6 of the Master Form).		QE QE 086 SPC	4/13/89
2.3	Set the Number of waves averaged as 1.		QE QE 086 SPC	4/13/89
2.4	Place the I-98 in A-scope mode.		QE QE 086 SPC	4/13/89
2.5	Set the gain to 17.0 db		QE QE 086 SPC	4/13/89
2.6	Make sure a signal response is being obtained of the A-scope.		QE QE 086 SPC	4/13/89
2.7	Switch the three Band Pass Filters as follows: 0.5 MHz High Pass Filter - ON 4.0 MHz Low Pass Filter - OFF 8.0 MHz Low Pass Filter - OFF		QE QE 086 SPC	4/13/89

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-GSE	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

KSC FORM 4-124D (REV. 7/86)

PAGE [illegible] OF 25	MOD SHEET NO.	CONTROL NO. 4A156	TPS NO. [illegible]-001-0005

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

ITEM NO.	DESCRIPTION *(print or type)*	TECH.	INSP. CONTR	INSP. GOVT.
2.8	Sweep the signal on the [illegible] Instruments, 2022C Signal Generator per the following table. [illegible] and the Amplitude Response (in %FSH) at right.		QE / QE 086 SPC	4/13/89
2.9	Did the 0.5 MHz High Pass Filter perform properly? YES ✓ NO ____		QE / QE 086 SPC 4/13/89	

Frequency	Amplitude Response
250.0 kHz	2.3
300.0 kHz	3.1
350.0 kHz	7.0
400.0 kHz	15.6
450.0 kHz	32.0
500.0 kHz	51.6
550.0 kHz	82.8
600.0 kHz	95.3
650.0 kHz	96.1
700.0 kHz	93.8
750.0 kHz	92.2
850.0 kHz	94.5
950.0 kHz	98.4
1.00 MHz	100.0

4/13/89 QE 086 SPC
QE NOTE:
250KHz - 0%FSH
300KHz - 0%FSH
800KHz - 93.0%FSH

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				[illegible]

APPROVALS – REFER TO LOCAL PROCEDURES

NAME	ORG	DATE	NAME	ORG	DATE
1 GS 49	THI-GSE	12 APR 89	1 [signature]	THI-LSE	APR 11 '89
2 [signature]	TV-MSD-22		2 QE 086 SPC	THI-QE	APR 10 '89

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		MOD SHEET NO.
		CONTROL NO. 1A156
		TPS NO. [illegible]

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
2.10	Switch the three Band Pass Filters as follows: 0.5 Mhz High Pass Filter - OFF 4.0 Mhz Low Pass Filter - ON 8.0 Mhz Low Pass Filter - OFF		QE QE 086 SPC 4/13/89	
2.11	Sweep the signal on the Marconi Instruments, 2022D Signal Generator per the following table. Record the Amplitude Response (in %FSH) at right.		QE 086 SPC QE 4/13/89	

Frequency	Amplitude Response
1.00 MHz	100.0
1.50 MHz	100.0
2.00 MHz	100.0
2.50 MHz	97.7
3.00 MHz	99.2
3.50 MHz	98.4
4.00 MHz	78.9
4.50 MHz	7.8
5.00 MHz	1.6
5.50 MHz	1.6
6.00 MHz	1.6
6.50 MHz	1.6
7.00 MHz	1.6

4/13/89 QE 086 SPC
QE NOTE:
5.50 - 7.0 MHz
READINGS WERE
0% FSH

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	[illegible]				[illegible]

APPROVALS - REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS [illegible]	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

KSC FORM 4-124D (REV. 7/86)

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

MOD SHEET NO.

CONTROL NO. 4A156

TPS NO. [illegible]-0479-00-001-000[illegible]

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
2.12	Did the 4.0 MHz Low Pass Filter perform properly? YES ✓ NO ____		QE 086 SPC 4/13/89	
2.13	Switch the three Band Pass Filters as follows: 0.5 Mhz High Pass Filter - OFF 4.0 Mhz Low Pass Filter - OFF 8.0 Mhz Low Pass Filter - ON		QE 086 SPC 4/13/89	
2.14	Sweep the signal on the Marconi Instruments, 2022D Signal Generator per the following table. Record the Amplitude Response (in %FSH) at right.		QE 086 SPC 4/13/89	

Frequency	Amplitude Response
5.00 MHz	89.8
5.50 MHz	94.5
6.00 MHz	93.0
6.50 MHz	93.8
7.00 MHz	93.8
7.50 MHz	88.3
8.00 MHz	68.8
8.50 MHz	26.6
9.00 MHz	8.6
9.50 MHz	3.9
10.00 MHz	1.6
10.50 MHz	1.6

4/13/89 QE 086 SPC
QE NOTE: 5MHz → 71.9-97.7%FSH
10-10.5MHz → 0%FSH

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR.	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				APR 13 '89

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 13 '89

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

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CONTROL NO. 1A156
TPS NO. E77-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
2.15	Did the 8.0 MHz Low Pass Filter perform properly? YES ✓ NO ____		QE 086 SPC 4/13/89	
2.16	If any of the Band Pass Filters did not perform as expected, verify that all connections unique to this test are properly hooked up and that all settings on the appropriate equipment are correct. Then reperform the steps for the failed filter, and record comments and data below. Data and comments: ____ Not performed QE 086 SPC 4/13/89		② QE 086 SPC 4/13/89 N/A	
2.17	Turn the power OFF from the Marconi Instrument. VERIFY CSR-028	T	Q	
2.18	Disconnect Channel 1 from the Marconi Instrument Receive Port and connect back to the RPF.	T	Q	APR 13
3.0	VERIFICATION OF THE A/D CONVERTER:			
~~3.1~~	~~Disconnect 2090 scanner from the 250 FT. cable and install WASATCH 2090 scanner to the 250 FT. cable.~~	T ①	Q	
3.2	Connect the 10 in. arm with the 5 MHz transducer provided and connect channel 1.	T	Q	
3.3	Place the 2090 scanner on the magnetic track.	T	Q	13
3.4	Set up the couplant pump per QE's direction. ① VOID! AWAITING MOD TO DELETE ITEM 3.1 / NOTIFIED R. PATTISON ESE ENG. 1430 HRS.	T	Q	13

② Stamped in error 4/13/89 QE 086 SPC

SPC 1020 '89 001 STEP 1.0 see MOD

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89		①		

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LOG	APR 13 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

KSC FORM 4-124D (REV. 7/86)

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		CONTROL NO. 4A156
		TPS NO. 077-0479-00-001-0003

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
3.5	Perform setting the following information as shown below: A. Set A/D sampling rate to 20 MHz. B. Set sampling increment to 0.1 in. C. Set the ~~Y-axis~~ X QE 189 SPC 13APR89 stepper motor scanning velocity to maximum. D. Place the system in the RF Data Acquisition mode. E. Set the A-gate as follows: A-gate delay: 35 microseconds A-gate width: 25 microseconds F. Set the C-gate as follows: C-gate delay: 41 microseconds C-gate width: 15 microseconds G. Set the scan area to 5.0 in circumferentially and 0.3 in axially		QE QE 189 SPC 13APR89	
3.6	If the scan velocity is excessive , the scan will terminate prematurely. If that happens, decrease the scanning velocity by 0.5 in/sec increments and attempt the scan again until the scan is completed. Record comments below: Comments: ______ Not Preformed QE 189 SPC 13APR89		① 13APR89 QE 189 SPC QE/ N/A	
3.7	Execute the scan sequence.		QE QE 189 SPC 13APR89	
3.8	Verify that data has been taken in the C-scan.		QE QE 189 SPC	
3.9	Verify that the 5.0 MHz wave form has been accurately digitized and displayed in the ~~A-scan~~ C-SCAN QE 189 SPC 13APR89, make a hard copy of the C-scan and attach to this T.P.S., record the scanning speed below. Scanning Speed: X= 10 IN/S Y= 1.0 IN/S		13APR89 QE QE 189 SPC	

① Stamped in Error 4/13/89 QE 086 SPC

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				APR 1

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 1	1	[signature]	THI-LSE	APR 13 '89
2	[signature]	TV-MSD-24	APR 1 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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		MOD SHEET NO.
		CONTROL NO. 4A156
		TPS NO. 577-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
3.10	If the wave form is not digitized properly, decrease the scanning speed by 0.5 in./sec. increments and rescan. Record the scanning speed below. Scanning Speed: ____________ Not Performed QE 189 SPC 13APR89		QE N/A	
4.0	TRANSDUCER ANALYSIS SOFTWARE VERIFICATION TEST UTILIZING VIP 4.0 SOFTWARE:			
4.1	Place the 2090 scanner on/vicinity to the test block per QE's direction using the magnetic track.	T APR 1 3 89	Q	
4.2	Manually adjust the X-Y axis arms so to place the transducer's transmitting face in the center of the aluminum test block.	T APR 1 3 89	Q	
4.3	Place the URBIS in the A-scope mode, using a SET form created from MSTFFT. Record the set form name below. Form Name: SETQTØ1		QE QE 189 SPC 13APR89	
4.4	Set pulse width using the formula as shown below: P. W. = 1 / 2FR , where: P. W. = Pulse Width, F_R = Resonant Transducer Frequency P.W. : 100ns		13APR89 QE QE 189 SPC	
4.5	Adjust pulse voltage so noise is not above 7 % FSH., and set the sampling rate to 40.0 MHz.		13APR89 QE QE 189 SPC	

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	QE 49	THI-GSE	APR 10 '89	1	D R Crawford	THI-LSS	APR 13 '89
2	Bruce Hardman	TV-MSD-22	APR 10 '89	2	QE 086 SPC	THI-QE	APR 10 '89

KSC FORM 4–124D (REV. 7/86)

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

MOD SHEET NO.
CONTROL NO. 4A156
TPS NO. 077-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
4.6	Using sufficient A-gate, adjust the C-gate to capture the first complete back surface reflection off the aluminum test block. Adjust the gain to achieve the signal amplitude of 80 % FSH. Record the gain below. GAIN: 8.0 dB		QE QE 18 SPC 13APR89	
4.7	Perform the transducer analysis.		QE QE 189 SPC 13APR89	
4.8	Verify following information are shown on transducer analysis software verification test, make a hard copy of the transducer analysis and attach to this T.P.S: A. Sampling rate B. Peak magnitude C. Peak frequency D. Upper and lower 6 dB limits E. Band width center frequency F. Band width G. Time - Based response H. Spectral response		QE QE 189 SPC 13APR89	
5.0	ELECTROMAGNETIC INTERFERENCE SHIELDING DATA ACQUISITION CABLE VERIFICATION TEST:			
5.1	Place the system in the A-Scope mode, set the A-scan gate to 5.0 microseconds and the sampling rate to 20.0 MHz.		QE 086 SPC QE	
5.2	Position the scanner over a bonded region on the calibration block, set signal to 35 % FSH off the eight multiple back wall reflection.	4/10/89 QE 086 SPC	QE QE 086 SPC 4/14/89	

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	D. R. Graf	THI-LSS	[illegible]
2	Bruce Hardon	TV-MSD-24	APR 12	2	QE 086 SPC	THI-QE	APR 10 '89

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

MOD SHEET NO.

CONTROL NO. 4A156

TPS NO. 577-0479-00-001-0003

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
5.3	Set the scan area to 10.0 in. axially by 5.0 in. circumferentially.		QE 189 SPC 14APR89	
5.4	Perform the scan and record the signal response from each pass below. Pass Number / Signal Response (% FSH) 1 36.2 2 40.3 3 37.1 4 41.7		QE 086 SPC 4/14/89	
5.5	Verify that the signal response does not vary by more than 10% at any time during the test. Check correct response below. Less than 10%: ✓ More than 10%: ______		QE 086 SPC 4/14/89	
5.6	If the signal response vary by more than 10 % at any time during the test, reperform the signal response test. Pass Number / Signal Response (% FSH) 1 ______ 2 ______ 3 ______ 4 ______ Not performed QE 086 SPC 4/14/89		① QE 086 SPC 4/14/89 N/A	
5.7	Take a strong magnet (at least 20 lbs. lifting force) and expose the RDAS, RPP, Scan Controller, and cabling to magnetic force.	2020	Q	
5.8	Verify the EMI shielding is performing properly, by viewing the A-scope presentation. Record comments below. comments: NO NOTICEABLE EFFECT ON SIGNAL		QE 189 SPC 14APR89	

QE 086 SPC ① stamped in error 4/14/89

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086	THI-QE	APR 10 '89

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		TPS NO. E77-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
6.0	Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST:			
6.2	Zero the encoders with the transducer in the extreme -Y position.		QE QE 086 SPC 4/14/89	
	NOTE Mark the membrane sample to represent the transducers centerline perpendicular to the Y-axis.			
6.3	Using the scanner position option in the scanner menu, instruct the 2090 scanner to move the transducer ~~8.0~~ 7.0 QE 086 SPC 4/14/89 in. in the +Y direction.		QE QE 086 SPC 4/14/89	
6.4	Place a mark on the membrane sample where the scan terminated.			
	NOTE The mark on the membrane sample will represent the transducers centerline perpendicular to the Y-axis.			
6.5	With a ruler divided into 0.1 in. increments, measure the distance between the two marks, and read the indicated Y-axis position from the screen presentation. Record following information below.		QE QE 086 SPC 4/14/89	

	Indicated Y-axis position	Actual Y-axis position	Delta
Run 1	7.0 IN.	7.006 IN.	0.006 IN.
Run 2	7.0 IN.	6.993 IN.	0.007 IN.
Run 3	7.0 IN.	7.009 IN.	0.009 IN.

Final steps/inch : N/A

Counts/inch: N/A

PREPARED BY	ORG.	EXT.	DATE	PAGE ACCEPTANCE	CONTR	GOVT.	DATE
J. YUN / J. PICO	THI-QE	6251	4-02-89				

APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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TEST PREPARATION SHEET (WORD PROCESSOR CONTINUATION)

MOD SHEET NO.

CONTROL NO. 4A156

TPS NO. E77-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
6.6	If the difference between the indicated and actual Y-axis position is greater than 0.1 in., reperform and change the steps/inch of the stepper motor, or counts/inch of the encoder until the difference between the indicated and actual values is within 0.1 in. Record below as shown.		N/A QE	
	Indicated Y-axis position / Actual Y-axis position / Delta Run 1 ______ ______ ______ Run 2 ______ ______ ______ Run 3 ______ ______ ______ Final steps/inch : ______ Counts/inch: ______ Not Performed QE 086 SPC 4/14/89			
7.0	X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST:			
7.1	Zero the encoders with the transducer in the extreme -X position, and with enough room to move 16.0 in. in the +X direction, at a sampling increment of 0.1 inch and sampling rate at 20.0 MHz.		QE 086 SPC QE 4/14/89	
7.2	Using the scanner position option in the scanner menu, instruct the 2090 scanner to move the transducer 16.0 in. in the +X-axis, mark the transducer centerline perpendicular to the X-axis. Perform the scan by encoder being zeroed.	T	Q QE QE 086 SPC 4/14/89	
7.3	Place a mark on the membrane sample where the scan terminated. **NOTE** The mark on the membrane sample will represent the transducers centerline perpendicular to the X-axis.	T	Q	

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	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
7.4	With a ruler divided into 0.1 in. increments, measure the distance between the two marks, and read the indicated X-axis position from the screen presentation. Record following information below.		QE QE 086 SPC 4/14/89	
7.5	If the difference between the indicated and actual position is greater than 0.1 in., reperform and change the steps/in. of the stepper motor, or counts/in. of the encoder until the difference between the indicated and actual values is within 0.1 in.		N/A QE	

7.4

	Indicated X-axis position	Actual X-axis position	Delta
Run 1	16.0 IN.	16.065 IN	0.065 IN.
Run 2	16.0 IN.	16.0 IN.	0.0 IN.
Run 3	16.0 IN.	16.0 IN.	0.0 IN.

Final steps: N/A
Counts/inch: N/A

7.5

	Indicated X-axis position	Actual X-axis position	Delta
Run 1			
Run 2			
Run 3			

Final steps: ________
Counts/inch: ________

Not Performed QE 086 SPC 4/14/89

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	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-22	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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		CONTROL NO. 3A156
		TPS NO. [illegible]-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
8.0	Y-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES:			
8.1	Perform the followings for Y-axis scanning velocity verification test Peak Detect, and record below:	T [illegible]	Q QE QE 189 SPC 14APR89	
	A. Set Y-axis scan velocity to 4.0 in./sec.			
	B. Set A/D converter sampling rate to 20.0 MHz.			
	C. Set A-scan delay to 15.0 microsecond.			
	D. Set A-scan Width to 12.0 microsecond.			
	E. Set sampling increment to 0.1 inch.			
	F. Place system in Peak Detect mode.			
	G. Set signal response level off the eight multiple back-wall reflection to 35 % FSH.			
	H. Position transducer over zero mark on membrane sample.			
	I. Activate a stop watch at the same time the scanner begins moving.			
	J. When the transducer crosses the ~~12.0~~ 6.0 QE 189 SPC 12APR89 in. mark on the membrane sample, terminate the stop watch.			
8.2	Perform the scan velocity Peak Detect, verify the difference between the entered and actual scan speeds is in +/- 0.5 inch. If the screen data presentation is acceptable, make a hard copy of the screen and attach to this T.P.S.		QE QE 189 SPC 14APR89	
	Time / Velocity (~~12.0~~ 6.0 QE 189 SPC 12APR89 in./time)			
	Run 1: 1.56 s / 3.85 IN/S			
	Run 2: 1.49 s / 4.03 IN/S			
	Run 3: 1.58 s / 3.80 IN/S			
	Scan velocity: ENTERED 4 IN/S ACTUAL (AVG. 3.89 IN/S)			
	Not Performed N/A			

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	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	[illegible]	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086	THI-QE	APR 10 '89

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ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
8.3	If the difference is greater than + - 0.5 inch, increment down by 0.5 in./sec. until an acceptable scan is obtained. Make a hard copy of the screen and attach to this T.P.S. Time / Velocity (12.0 in./time) Run 1 ______ ______ Run 2 ______ ______ Run 3 ______ ______ Final scan velocity: ______ Not Performed ~~N/A~~ ① QE 189 SPC 14APR89		N/A QE QE 189 SPC ①	
8.4	Perform the above substeps A through J of the step 8.1 on Y-axis scanning velocity verification test RF Mode and except for the following. 1. Place system in RF mode. 2. Set C-scan gate delay to 20.0 microseconds. 3. Set C-scan gate width to 5.0 microseconds. QE 086 SPC 4/14/89 Time / Velocity (~~12.0~~ 6.0 in./time) Run 1 1.48 s 4.05 in/s Run 2 1.51 s 3.97 in/s Run 3 1.47 s 4.08 Scan velocity: ENTERED 4.0 IN/S ACTUAL (AVERAGE) ≥ 4.03		QE QE 189 SPC 14APR89	

①ENTERED IN ERROR 14APR89 QE 189 SPC

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	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12	1	[signature]	THI-LSS	APR 11 '89
2	B. Haiden [signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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		CONTROL NO. 4A156
		TPS NO. 577-0075-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
8.5	If the difference is greater than +/- 0.5 inch, increment down by 0.5 in./sec. until an acceptable scan is obtained. Make a hard copy of the screen and attach to this T.P.S. Time / Velocity (12.0 in./time) Run 1 ______ ______ Run 2 ______ ______ Run 3 ______ ______ Final scan velocity: ______ Not Performed QE 189 SPC 14APR89		QE N/A	
9.0	X-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES:			
9.1	Perform the followings for X-axis scanning velocity verification Peak Detect, and record below: A. Set X-axis scan velocity to 4.0 in./sec. B. Set A/D converter sampling rate to 20.0 MHz. C. Set A-scan delay to 15.0 microsecond. D. Set A-scan Width to 12.0 microsecond. E. Set sampling increment to 0.1 inch. F. Place system in Peak Detect mode. G. Set signal response level off the eight multiple back-wall reflection to 35 % FSH. H. Position transducer over zero mark on membrane sample. I. Activate a stop watch at the same time the scanner begins moving. J. When the transducer crosses the ~~10.0~~ 8.0 QE 189 SPC 12APR89 in. mark on the membrane sample, terminate the stop watch.	T	QE 189 SPC 14APR89	

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NAME	ORG	DATE	NAME	ORG	DATE
1 GS 49	THI-GSE	APR 12 '89	1 [signature]	THI-LSS	APR 11 '89
2 [signature]	TV-MSD-24	APR 12	2 QE 096 SPC	THI-QE	APR 10 '89

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ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
9.2	Perform the scan velocity Peak Detect, verify the difference between the entered and actual scan speeds is in +/- 0.5 inch. If the screen data presentation is acceptable, make a hard copy of the screen and attach to this T.P.S.		QE QE 189 SPC 14APR89	
9.3	If the difference is greater than +/- 0.5 inch, increment down by 0.5 in./sec. until an acceptable scan is obtained. Make a hard copy of the screen and attach to this T.P.S.		QE N/A	

9.2

QE 189 SPC 12APR89

	Time	Velocity (~~16.0~~ 8.0 in./time)
Run 1	2.06s	3.88 in/s
Run 2	1.98s	4.04 in/s
Run 3	2.16s	3.70 in/s

Scan velocity: ENTERED 4.0 IN/S
ACTUAL (AVERAGE) ⇒ 3.87 IN/S

Not Performed N/A

9.3

	Time	Velocity (12.0 in./time)
Run 1		
Run 2		
Run 3		

Final scan velocity: ____________

Not Performed QE 189 SPC 14APR89

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	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086	THI-QE	APR 10 '89

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		CONTROL NO. 4A156
		TPS NO. C77-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
9.4	Perform the above substeps A through J of the step 9.1 on X-axis scanning velocity verification test RF Mode and except for the following.		QE 189 SPC 14APR89	
	1. Place system in RF mode. 2. Set C-scan gate delay to 20.0 microseconds. 3. Set C-scan gate width to 5.0 microseconds. QE 189 SPC 12APR89			
	Time / Velocity (~~16.0 in~~ 8.0 IN./time) Run 1 2.08 S 3.85 IN/S Run 2 2.10 S 3.80 IN/S Run 3 1.95 S 4.10 IN/S Scan velocity: ENTERED VALUE 4.0 IN/S ACTUAL VALUE (AVERAGED) 3.92 IN/S			
9.5	If the difference is greater than +/- 0.5 inch, increment down by 0.5 in./sec. until an acceptable scan is obtained. Make a hard copy of the screen and attach to this T.P.S.		QE N/A	
	Time / Velocity (16.0 in./time) Run 1 ____ ____ Run 2 ____ ____ Run 3 ____ ____ Final scan velocity: ____ Not Performed QE 189 SPC 14APR89			

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1	GS 49	THI-GSE	APR 12 '89	[signature]	THI-LSS	APR 11 '89
2	[signature]	TV-MSD-24	APR 12 '89	QE 086 SPC	THI-QE	APR 10 '89

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		CONTROL NO. 4A156
		TPS NO. [illegible]-0479-00-001-00[illegible]

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
10.0	UNINTERRUPTIBLE POWER SUPPLY VERIFICATION TEST:			
10.1	Set up the URBIS to perform a membrane scan as follows: A. Use 10" scanner arm. B. Set the scanner velocity to 10.0 in/sec C. Set the scan area to 10.0 in. axially by 5.0 in. circumferentially. D. Set the A-gate Delay to 15.0 microseconds. E. Set the A-gate Width to 12.0 microseconds. D. Set the C-gate Delay to 20.0 microseconds. E. Set the C-gate Width to 3.75 microseconds. F. Set the system for RF mode. G. The filename is SETPWR1		QE QE 189 SPC APR 1 '89	
10.2	As the system is scanning, disconnect the main power line to the system.		QE QE 189 SPC 1 4 '89	
10.3	Complete shutting the system down in accordance with AMDATA Engineering Specification Number 0701.0 section 1.0, subsection "Uninterruptible Power Systems" (UPS) and line filter. (Attachment 1)		QE QE 189 SPC	
10.4	Power the system back up, and verify that all data up to the point of power failure has been properly stored. This is verified by checking that a data file of the information that was taken during the test exists, and that no information is missing from either the A or C scans. This is Run 1.		QE QE 189 SPC 1 4 '89	

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NAME	ORG	DATE	NAME	ORG	DATE
1 GS 49	THI-GSE	APR 12 '89	1 [signature]	THI-LSS	APR 11 '89
2 B Hardman	TV-MSD-24	APR 12 '89	2	THI-QE	APR 10 '89

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ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
10.5	Perform two more runs and complete the following table (yes/no):		QE QE 189 SPC	

	RUN 1	RUN 2	RUN 3
FILENAME	SETPWR1	SETPWR2	SETPWR3
PROPER DATA STORAGE ACHIEVED	YES	YES	YES
WAS DATA FILE ACCESSIBLE?	YES	YES	YES
WERE A AND C SCAN PRESENTATIONS COMPLETE?	YES	YES	YES

10.6 Attach a printout of both the B and C scans for each run to this TPS. — QE QE 189 SPC

11.0 **CRT DISPLAY AND HARD COPY VERIFICATION TEST:**

11.1 Set up the URBIS as follows: — QE QE 086 SPC 4/17/89

A. Use the 10.0 inch arm with 5.0 MHz transducer.

B. Set the sampling increment to 0.10 inch.

C. Set the system for RF mode.

D. Set the A-gate delay to 15.0 microseconds.

E. Set the A-gate width to 30.0 microseconds.

F. Set the C-gate delay to 20.0 microseconds.

G. Set the C-gate ~~delay~~ width to 5.00 microseconds. QE 086 SPC 4/17/89

H. Set the system to scan an area that is ~~16.0~~ 4.0 inches axially by ~~3.0~~ 6.0 inches circumferentially. 4/17/89 QE 086 SPC QE 086 SPC 4/17/89

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1	GS 49	THI-GSE	APR 12 '89	1	D R Crawford	THI-LSS	APR 11 '89
2	Bruce Hardman	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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		CONTROL NO. 4A156
		TPS NO. C 7-0474-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
11.2	Set the color palette in the Master Form per AMDATA Engineering Specification 870128, Rev D, page 73, subsection "Color Palette" (Attachment 1). QE 086 SPC GS 49 4/10/89		QE 086 SPC QE 4/11/89	
11.3	Perform test sequence.		QE 086 SPC QE 4/11/89	
11.4	Call up C scan to verify that proper color assignment was achieved. This will appear as a color legend in the upper right hand corner of the screen. Also note the clarity of the colors on the screen presentation. The characters should be sharply defined and easy to read.		QE 086 SPC QE 4/11/89	
11.5	Make a hard copy presentation of the C-scan obtained from the above test sequence.		QE 086 SPC QE 4/11/89	
11.6	Compare the two presentations to verify that the same color legend appears on both and that all the characters are sharply defined and easy to read.		QE 086 SPC QE 4/11/89	
11.7	Record whether or not the two presentations match. (YES/NO) Did the two presentations match? YES		QE 086 SPC QE 4/11/89	

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1	GS 49	THI-GSE	APR 12 '89	1	D R Crawford	THI-LSE	APR 11 '89
2	B Harsina	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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CONTROL NO.	4A156
TPS NO.	C77-0479-00-001-0005

ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
12.0	DATA FILE INTEGRITY VERIFICATION TEST:		QE 086 SPC	
12.1	Set up the URBIS as follows:		QE 4/17/89	
	A. Use the 10.0 inch arm.			
	B. Use the 5.0 MHz transducer.			
	C. Set the sampling increment to 0.10 inch.			
	D. Set the system for RF mode.			
	E. Set the A-gate delay to 15.0 microseconds.			
	F. Set the A-gate width to 12.0 microseconds.			
	G. Set the C-gate delay to 20.0 microseconds.			
	H. Set the C-gate ~~delay~~ width to 5.00 microseconds. QE 086 SPC 4/11/89			
	I. Set the system [illegible] area that is ~~15.0~~ 4.0 inches axially by ~~8.0~~ 6.0 4/11/89 inches [illegible] circumferentially. QE 086 SPC 4/11/89			
	J. Set the filename to [illegible].			
	K. Insure the printer is configured properly.		QE 086 SPC 4/17/89	
12.2	Make sure a new data tape is present.		QE QE 086 4/17/89	
12.3	Perform the scan.		QE QE 086 4/17/89	
12.4	Save data to hard disk.		QE QE	
12.5	Record below whether all data has been stored properly to hard disk.		QE 4/17/89	

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APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE	NAME	ORG	DATE
1	QS 49	THI-SSE	APR 12 '89	D R Crawford	THI-LSS	APR 11 '89
2	B. Hardman	TV-MSD-2	APR 12 '89	QE 086 SPC	THI-QE	APR 10 '89

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ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
12.6	Obtain a hard copy of the C-scan, B-scan and Spectral C-scan.		QE QE 086 SPC 4/11/89	
12.7	Was all required data present on each hard copy per AMDATA Engineering Specification 870128, Section 10, and Appendix D? (ATTACHMENT-3) GS 49 4/10/89 QE 086 SPC YES ✓ NO ____		QE QE 086 SPC	
12.8	Transfer all the data files stored on the hard disk to tape.		QE QE 086 SPC 4/11/89	
12.9	Verify that the data files are on the tape.		QE QE 086 SPC 4/11/89	
12.10	Transfer all the data files stored on the tape to hard disk and verify that the data files are on the hard disk.		QE QE 086 SPC 4/11/89	
12.11	Obtain a hard copy of the C-scan, B-scan and Spectral C-scan.		QE QE 086 SPC 4/11/89	
12.12	Was all required data present on each hard copy per AMDATA Engineering Specification 870128, Section 10, and Appendix D? (ATTACHMENT-3) GS 49 4/10/89 QE 086 SPC YES ✓ NO ____		QE QE 086 SPC 4/11/89	
12.13	Compare the hard copies obtained on step 12.7 against the hard copies obtained on step 12.11.		QE QE 086 SPC 4/11/89	
12.14	Record below if there were any differences in amplitude response on the A and C-scans. NONE		QE QE 086 SPC 4/11/89	

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	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-QSE	APR 2 '89	1	[signature]	THI-LSS	APR 3 '89
2	[signature]	TV-MSD-24	APR 12 '89	2	QE 086 SPC	THI-QE	APR 10 '89

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ITEM NO.	DESCRIPTION (print or type)	TECH.	INSP. CONTR	INSP. GOVT.
12.15	Record below if there were any differences in phase response on the A-scans. NO		QE 086 SPC 4/17/89	
12.16	Record below if there were any differences in frequency response on the B, C and spectral C-scans. NO		QE 086 SPC 4/17/89	
12.17	Record below if there were any differences in color scales and display clarity. NO		QE 086 SPC 4/17/89	
12.18	Label and attach all hard copies taken during steps 12.7 and 12.11 to this TPS.		QE 086 4/17/89	
13.0	Disconnect the couplant pump. ~~VERIFY CSR-028~~	T 2917	Q	
14.0	~~Disconnect the Wasatch 2090 Scanner from the 250 ft Umbilical Cord, and install KSC 2090 Scanner.~~	T ①	Q	
15.0	Disconnect the 10in. scanner arm and the transducer from the 2090 scanner.	T 2917	Q	
16.0	Clean the calibration standard.	T	Q	
17.0	Secure all UT items back to the UT storage area.	T 2917	Q	
18.0	Close this T.P.S.		Q	

① OBTAINED IN ERROR. 2917

SPC 1090 APR 13 '89 001

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APPROVALS – REFER TO LOCAL PROCEDURES

	NAME	ORG	DATE		NAME	ORG	DATE
1	GS 49	THI-GSE	APR 12 '89	1	D. Kraft	THI-LO3	APR 13 '89
2	B. Faudman	TV-MSD-1	APR 13 '89	2	Janet A. Yun	THI-QE	APR 10 '89

KSC FORM 4-124D (REV. 7/86)

ATTACHMENT - 1

Chapter 1

INTRODUCTION

This manual provides the information necessary to set up and operate the IntraSpect/98 Ultrasonic Inspection System (I/98) using the Volumetric Inspection Package (VIP).

DESCRIPTION OF I/98

The I/98 consists of a scanner and scan controller, four-channel data acquisition system, fully programmable ultrasonic front end, data storage and analysis system.

I/98 VIP is Amdata's most advanced system for acquisition, imaging and analysis of ultrasonic data. Turn to page 1-2 for a block diagram of the system. A photograph of the system setup is on page 1-3.

Major System Components

(1) AMAPS 2090 ultrasonic scanner
(2) Scan Controller 5032
 (a) RF receiver
(3) Remote data acquisition system
(4) HP 9836SC computer
 (a) RGB monitor
 (b) CPU/floppy disks, keyboard
 (c) Hard drive
 (d) Tape backup system
(5) Dot matrix printer
(6) Remote pulser preamplifier
(7) IntraSpect 9836 APS software package
(8) Uninterruptable power supply
(9) 250-foot umbilical cable
(10) Document package
(11) Interconnection cables

Optional

- RS-232 communications computer interface

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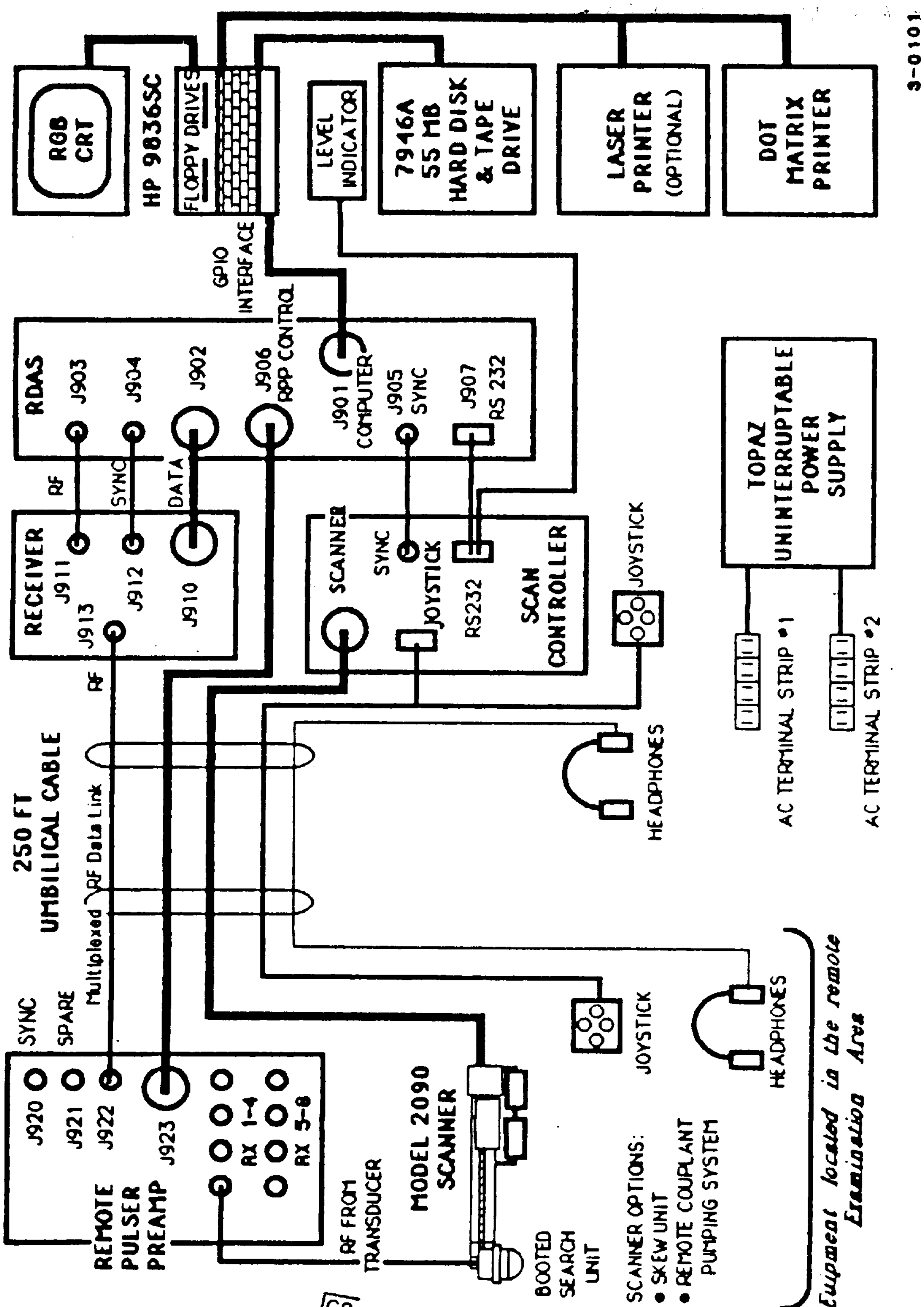
TV-MPD-24

TF~ NO. C77-0479-00 001-0005
CONTROL NO. 4A156

AMDATA ENGINEERING SPECIFICATION NO. 870128



IntraSpect/98 Automated Pipe Scanner
Power and Signal Interconnect Diagram

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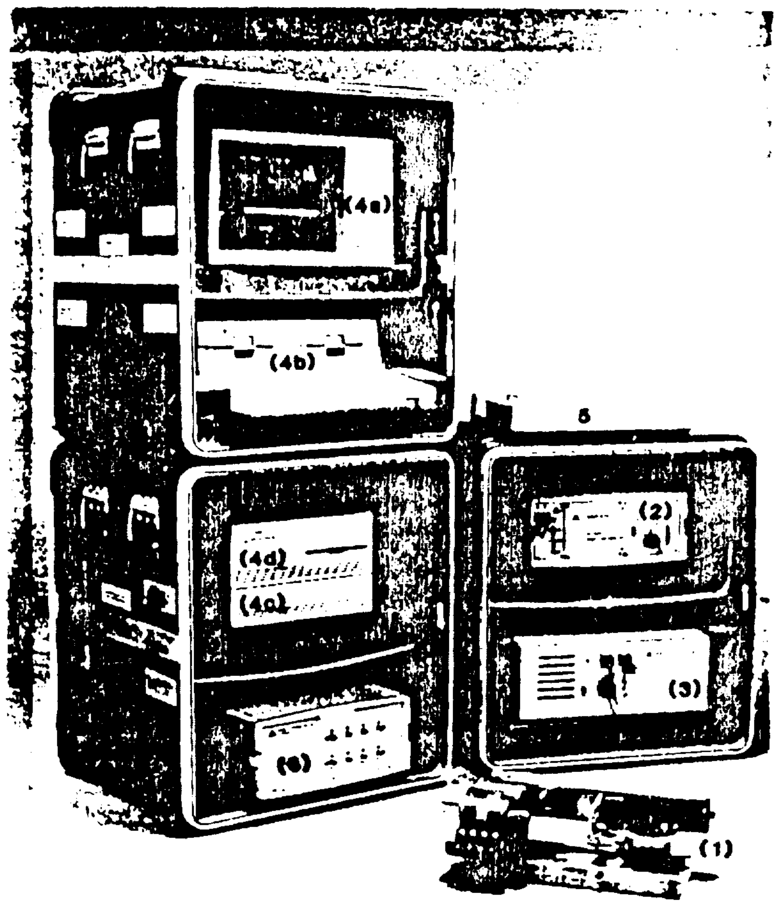

IntraSpect/98 Data Acquisition and Imaging System

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OTHER REFERENCES

For more detailed information, refer to the following:

ITEM	AMDATA PART NUMBER	DOCUMENT NUMBER
AMAPS 2090 Scanner Operating Manual	35095	841812
SC5032 Scan Controller User Manual	64500	850111
Remote Data Acquisition System (RDAS) Operating Manual	63170	850108
HP 9836SC Computer S/System	65021	EQ077
Uninterruptable Power Supply	35131	EQ76
Remote Pulser Preamplifier (RPP4RT) Operating Manual	63700	850201
Remote Receiver (RR4RT) Operating Manual	63600	850202
Umbilical Cable	64203	---
Intercom Assembly	63005	EQ078
Instructions for Installation of 360-Degree Track	35141	850115
Packing Cases	35083	---
IntraSpect/98 VIP Rev. C Software Package	13688	---

PERSONNEL QUALIFICATION

Before operating this equipment, personnel should be trained by Amdata or other qualified personnel in the following areas:

- IntraSpect/98 operation
- AMAPS scanner operation

The IntraSpect/98 operation is divided into the following subtopics:

- Test Record Format
- Recording Conventions
- IntraSpect/98 Test Checkout
- Calibration Procedures
- Scanning Procedures
- Data Interpretation

COMPONENTS AND EQUIPMENT

System Weights and Measurements

The weight of the system components, including the case and case size, are summarized below:

		Weight (pounds)	Size (inches)
Case #1:	HP 9836 C and display	142	25 1/2 x 30 x 31 3/8
Case #2:	UPS Hard disk drive Tape drive	86	24 x 14 x 22
Case #3:	Scan controller Remote DAS/AD subsystem Receiver	150	26 1/2 x 30 x 31 3/8
Case #4:	AMAPS scanner Test fixture Spare scanner parts	32	15 x 27 x 26
Case #5:	Cable 250'	132	35 x 16 x 25
Case #6:	Remote pulser preamp	45	23 x 14 x 21
Case #7:	360-degree tracks to fit 12", 20", 22", 24", 28" pipe sizes and a 4" to 6" adaptor	70	15 x 27 x 26
Case #8:	Printer (dot matrix) Software and documents Spare parts and expendables	35	9 x 15 x 21

Note: Fuses are taped to the back of the units.

System Modules

To operate and checkout the following components without the HP 9836SC minicomputer in operation, connect a separate terminal with a 9600 baud RS-232C interface (optional equipment) to system modules.

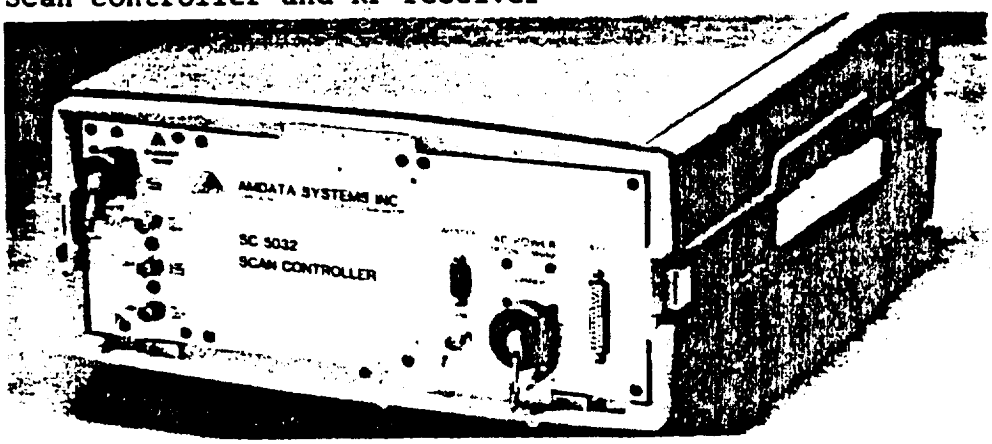
- Scan controller
- Remote data acquisition system (RDAS)
- Receiver
- Remote pulser/receiver

The HP diagnostics are included with the Pascal 3.0 software package.

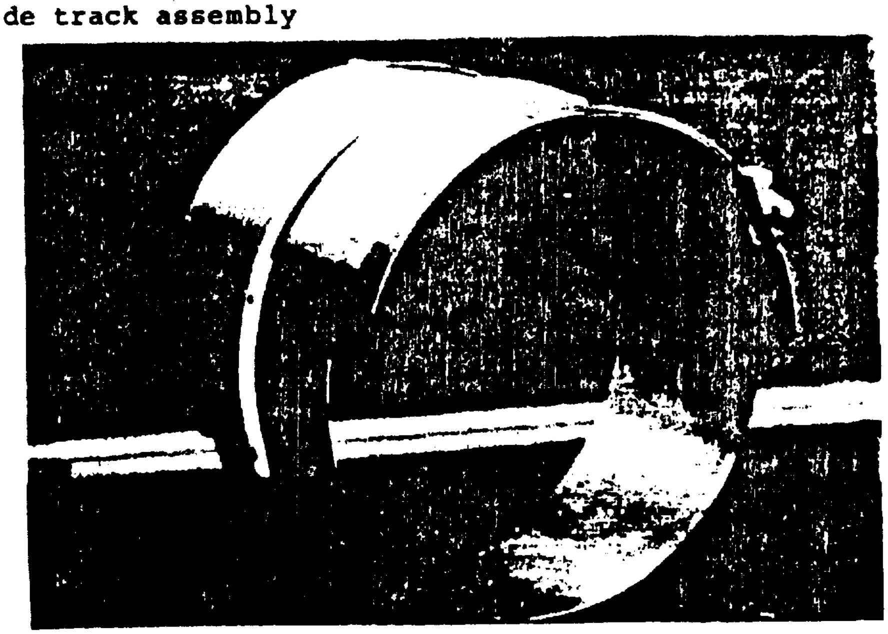
SCANNING SUBSYSTEM

Scanner and search unit

Scan controller and RF receiver



Guide track assembly



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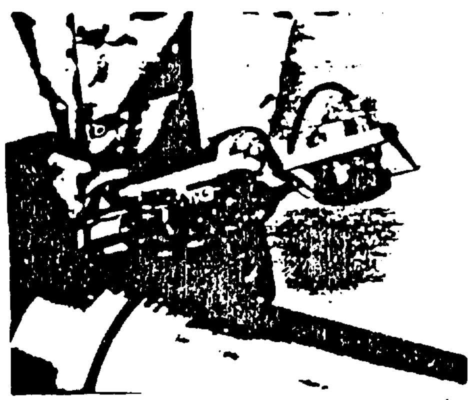
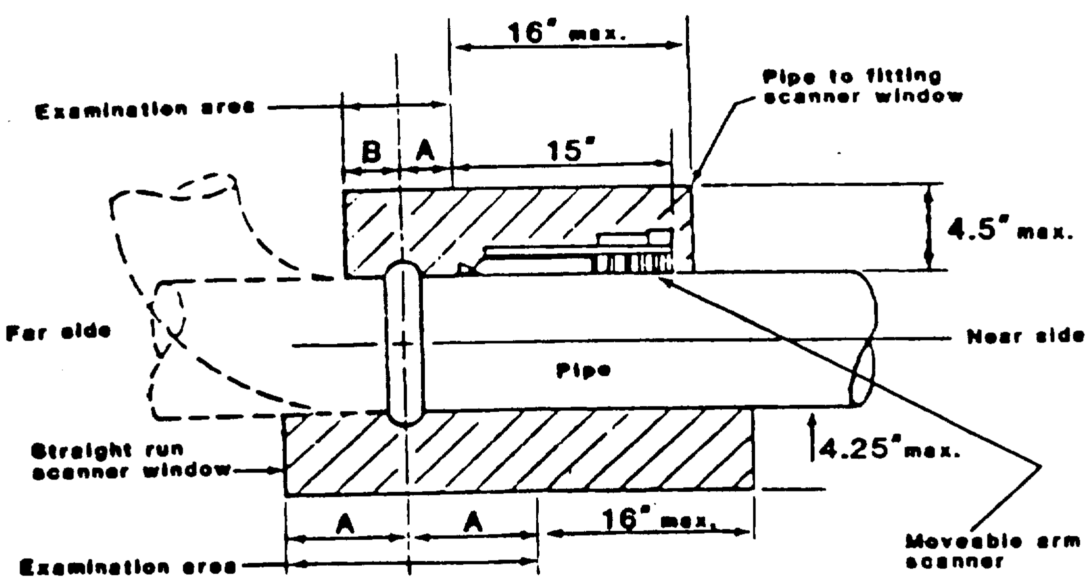
Scanner

The scanner mounts on a guide track assembly. The wheels of the scanner magnetically couple to the guide track and installation usually takes less than five minutes. The scanner can locate ultrasonic targets within +/-0.03 inch and repeat the measurement within +/-0.06 inch.



A profile of a scanner installed on a pipe and the examination area it covers is shown below.



A: 5.05" max.
B: 3.7" max.

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Scan Controller Function

Amdata's scan controller provides slaved or remote control of the scanner. The controller accepts input from an examination operator using a joystick or an RS-232 communications computer interface. The controller operates the scanner motors and accomplishes all scanner-related functions. It maintains count of encoder outputs from the scanner and relays the information to the computer.

The sync output from the controller provides a timing signal that drives other devices, such as the pulser, oscilloscope, data-acquisition system, or other accessory. The 9,600-baud, RS-232C interface is used for communication between the controller and the computer.

The scan controller and power module are packaged in a Tektronix TM 515 power module that operates on 48 to 60 Hz and 90 to 132 or 180 to 260 volts. It weighs approximately 30 pounds, and measures approximately 15 inches wide, 6.8 inches high, and 20 inches deep.

The operator in the examination area can read the scanner position scales and the operator in the control area can observe the encoder position readouts at the controller.

Track

The flexible, mild-steel, guide track adapts to the surface of virtually any geometry and curvature. Because of the flexibility of the track the scanner can be installed on a wide variety of surfaces.

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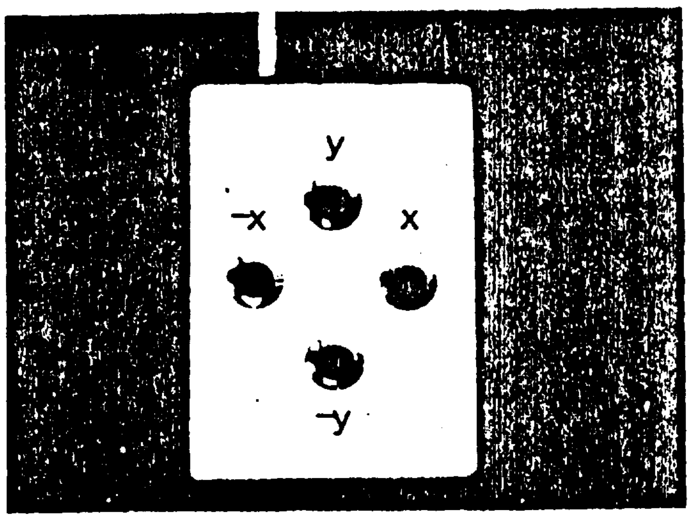
Setup

Use the push-button control to position the scanner. Mark off the opposite diagonals of a scan rectangle. Alternatively, only the starting point need be indicated.



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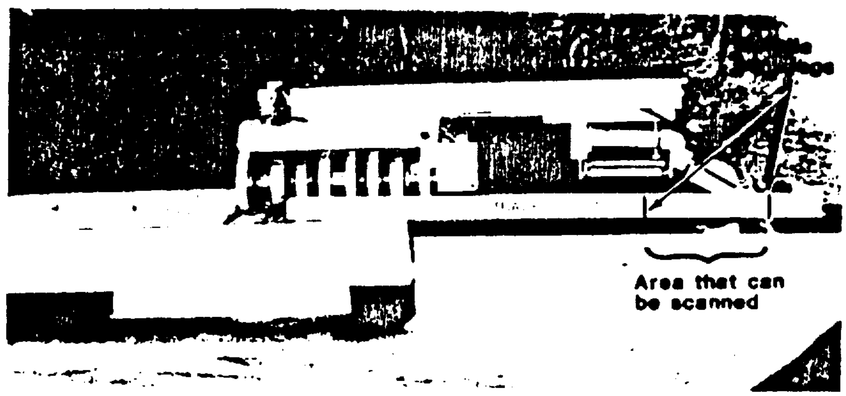
Poor Lighting/Track Locator

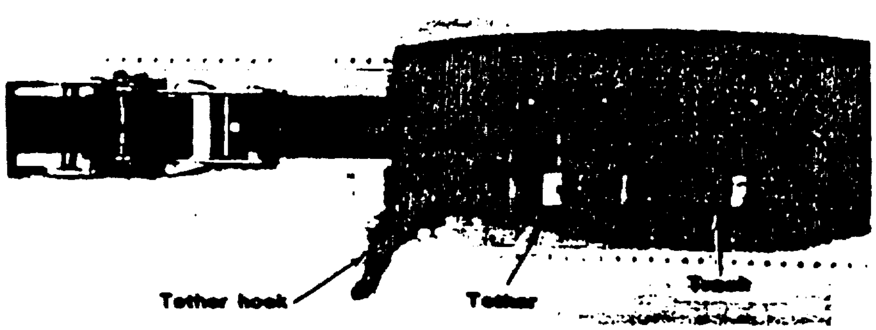
Installation can be accomplished in near darkness. The modular design of the track and scanner facilitates installation in poorly lighted areas. The track locator shown below has tactile markings to aid in positioning the lightweight track. Usually the weld crown can be found in poor light.

The track locator is used to start the scan at the weld centerline.



Tether

The tether is a safety cord provided as a precaution in the event the scanner slips off the track. One end attaches to the scanner and the other attaches to a nearby support structure. The tether hook should be attached to the scanner with its open side up to allow maximum clearance of the hook from the scanner trucks. Adjust the tether length so it is long enough to allow free scanner motion but short enough to keep the scanner from impacting on a hard surface if it falls.



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ULTRASONIC INSTRUMENTATION

The ultrasonic subsystem is designed to operate with commercial components. A computer-controlled pulser/receiver is located in the examination area and a computer-controlled receiver is located in the control area. Headphones are used for communication between the examination and control areas.

REMOTE DATA ACQUISITION SYSTEM (RDAS)

The RDAS coordinates the scan controller and the ultrasonic subsystem to produce ultrasonic waveform samples at specific scan grid points. It operates as a slave to the master computer and provides data to the HP 9836. The speed of the system is substantially increased by requiring the HP to set up the scan and thereafter only store and image the data.

The RDAS contains a high-speed, analog-to-digital (A/D) converter (20 MHz transient recorder) and a microprocessor that controls the synchronization between scanner motion and the A/D function. This is accomplished via the respective sync pulses.

UNINTERRUPTABLE POWER SYSTEM (UPS) AND LINE FILTER

In the event the main power is lost, the Topaz UPS 84864 supplies a load of 800 VA for nine minutes. The measured load of 3.85A allows operation for up to 25 minutes. This permits the operator to terminate the operation and save data before the system must be shut down. The system should be shut down as soon as possible to avoid totally discharging the UPS.

The Topaz UPS 84864 has an AC line filter that provides at least 40 dB attenuation at a frequency of 100 kHz. It operates automatically when used properly, connecting the AC line whenever the line voltage is above 85% of nominal. Operation requires the ON/OFF switch be on (the indicator light illuminates when power is at the output recepticle). The audible alarm beeps at 8-second intervals and sounds whenever the inverter is running.

Do not leave the UPS on line when the system is unattended (switch the UPS off). Otherwise the unit can discharge if the facility power is lost. It requires 16 hours to fully recharge the unit after being totally discharged.

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ATTACHMENT-2 TPS ... -00-001-0005 CONTROL NO. 4A156

COLOR PALETTE

Colors 1 - 3

Display	BLACK			BROWN			RED		
(R,G,B)	0	0	0	0.45	0.25	0	0.8	0	0
Seiko	BLACK	BLACK		BLACK	MAGENTA		RED	RED	
	BLACK	BLACK		BLUE	RED		RED	RED	
PJ (R,G,B)	4	4	6	12	8	10	53	8	14

Colors 4 - 6

Display	ORANGE			ORANYELLOW			YELLOWORAN		
(R,G,B)	1	0.40	0	0.98	0.6	0	1.0	0.80	0
Seiko	RED	WHITE		YELLOW	RED		YELLOW	RED	
	WHITE	RED		RED	YELLOW		YELLOW	YELLOW	
PJ (R,G,B)	62	21	13	72	41	13	74	45	22

Colors 7 - 9

Display	YELLOW			WHITE			SATURATED		
(R,G,B)	1.0	1.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0
Seiko	YELLOW	YELLOW		WHITE	WHITE		MAGENTA	MAGENTA	
	YELLOW	YELLOW		WHITE	WHITE		MAGENTA	MAGENTA	
PJ (R,G,B)	89	83	13	90	88	85	53	5	25

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AMPLITUDE MAP

Amplitude units BINARY

Colors 1 - 3

BLACK		BROWN		RED	
0	15	16	23	24	31

Colors 4 - 6

ORANGE		ORANYELLOW		YELLOWORAN	
32	39	40	47	48	55

Colors 7 - 9

YELLOW		WHITE		SATURATED	
56	63	64	126	127	127

POLARITY MAP (Threshold 5 %FSH)

Negative phase				Positive phase			
SATURATED		RED		YELLOW		SATURATED	
0	0	1	127	128	254	255	255

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ATTACHMENT-3

APPENDIX O

SPECTRAL C-SCAN

INTRODUCTION

The Spectral C-scan is a data analysis method that displays the frequency content of each waveform in a selected scan region. The sum of the energy in up to four frequency bands are color coded and displayed either in a separate C-scan window or superimposed on the standard C-scan. The form has been modified to support four user defined frequency bands and nine-color spectral mapping.

REQUIREMENTS

Prerequisite options required: None

Option revision: 1.0
Revision history: Released as an option to VIP Revision D.

Software revision required: VIP Revision D

Form revision required: E

RDAS revision required: E18

Scan controller revision required: C

References: I/98 VIP Operating Manual, General Information on the C-scan display and Transducer Analysis option in the appendices.

Programs for Digital Signal Processing. Edited by the Digital Signal Processing Committee, IEEE Press, 1979.

CAPABILITIES

Spectral C-scans may be performed on any rectangular region of waveforms that is displayed on the screen in a standard C-scan. A rectangular zoom cursor is used to define the analysis region. The Fast Fourier Transform (FFT) is performed on each waveform in the region. Frequency components within four frequency ranges specified in the form are summed and the resulting value is color coded and displayed using the form Spectral Color Map (Figure 1). The color map gives the magnitude ranges that map to each color.

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The FFT is an implementation of the radix-2 Cooley-Tukey algorithm performed in-place. As is the case for other I/98 analysis methods, the C-gate is used to select a portion of the waveform for analysis. However, this FFT algorithm requires that the number of digital samples transformed is a power of two. If necessary, the waveform in the C-gate is padded at the tail end with DC (binary 128) to meet the power of two requirement.

The spectral analysis region is defined by positioning and sizing the rectangular zoom cursor. After a region is analyzed, the system automatically switches to spectral mode, displays the spectral content of the region and outlines it with a white border in order to distinguish analyzed from unanalyzed regions. Cursor outlines are permanently affixed to the C-scan to identify analyzed regions.

At this point, additional analysis regions may be selected on the same C-scan. These regions may be separate, adjacent or overlapping. A set of such regions may be selected and assembled to provide a spectral mosaic which efficiently covers areas of interest only. Overlapping regions should be avoided whenever possible because: (a) the program will unnecessarily recompute the FFT for each overlapped waveform and (b) the white outline will obscure spectral data in another region.

Above the C-scan, the system displays:

1. The state of the Spectral C-scan toggle, either ON or OFF. When it is OFF, the underlying C-scan is displayed. When it is ON, all spectral analysis regions are outlined and filled according to the Spectral Color Map. The unanalyzed regions are unchanged. These two display states may be rapidly alternated in order to compare and contrast corresponding regions in the C-scan.

2. The horizontal and vertical dimensions of the zoom cursor and the horizontal and vertical magnification factors.

3. The Spectral C-scan color legend. This legend displays the nine-color code used to map the total energy contained in all four frequency bands. The mapping of color to energy is determined by the Spectral Color Map page of the form.

The results of the spectral analysis are automatically saved to disk and may be displayed again if desired. Spectral files are listed in the directory with a .Sn extension and may be acted upon by the relevant file utility programs, for example, copied from hard disk to floppy disk.

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ALGORITHMS/FORMULAS

The FORTRAN program, FOUREA, in Chapter 1.1 of Programs for Digital Signal Processing served as the model for the FFT implémentation

The magnitude of a single frequency component is equal to the square root of the sum of the squares of the real and imaginary parts:

Magnitude = (Real**2 + Imaginary **2) **1/2

SPECIAL KEYS USED

From the C-scan Zoom menu, four functions are available to support Spectral C-scans. They are:

Analyze:	<k3>	Performs spectral analysis on the contents of the zoom window, display and automatically saves results on disk (to FORMNAME.Sn).
Toggle:	<k4>	Toggle Spectral C-scan display on and off.
Read:	<k5>	Read and display the data in the spectral (from FORMNAME.Sn) disk file.
Stop:	<CLR_I/O>	Stop spectral analysis computation.

In discussion below these functions are referred to by name.

ERROR MESSAGES

No data in enclosed region
This message is displayed if the zoom cursor contains no valid data points because it is positioned entirely outside the C-scan region.

Spectral frequency band error
This message is displayed if:

(1) The spectral analysis frequency bands are negative or greater than 1/2 the sampling rate.

(2) A revision of the form is used which does not contain spectral frequency bands.

RF data file not found; cannot compute spectra
The Spectral C-scan is an analysis method that requires the RF waveform data (.Dn). This message is displayed when spectral analysis is attempted on a data set which contains only peak data.

Spectral data file not found; cannot retrieve spectra
This message is displayed if the corresponding .Sn file is not found.

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RESTRICTIONS AND LIMITATIONS

The time to compute the Spectral C-scan depends upon the number of waves within the zoom cursor and the number of samples per wave. Waveforms with fewer samples will be processed significantly faster. Therefore:

1. The analysis region defined by the zoom cursor should be as small as possible to avoid lengthy processing delays.

2. The number of samples in the C-gate should be as small as possible and equal to a power of 2. The number of samples is the product of the C-gate width and the sampling rate.

SAMPLE WORK SESSION

Load a form which contains RF data, for example, system test form MSTPAUS. Then select C-scan from the Data Analysis menu.

A multi-stroke C-scan is displayed with a green stroke cursor covering the first stroke. Invoke the C-scan Zoom. A white, rectangular cursor, the zoom cursor, is displayed in the lower left hand corner of the C-scan. Initially, it encompasses a one pixel region. Select the zoom cursor sizing option (from the Zoom Help menu, <SHIFT>+<RECALL>). The <LEFT>/<RIGHT> and <UP>/<DOWN> arrow keys are used to change the horizontal and vertical dimensions, respectively, of the zoom cursor.

A white outlined rectangular magnification window is displayed directly above the C-scan. Select the magnification window sizing option (from the Zoom Help menu) and then use the arrow keys to adjust either the horizontal or vertical dimensions of the magnification window.

For example, expand the zoom cursor horizontally to 8 and vertically to 5 such that it encloses to 40 pixels region. Expand the magnification window by a factor of 24 horizontally and 32 vertically. The magnification window then contains 192 (8x24) x 160 (5x32) pixels.

While in the Zoom menu, press <SHIFT>+<ARROWKEY> to move the zoom cursor. Note that the C-scan area enclosed by the zoom cursor is simultaneously displayed above the C-scan in the magnification window.

Next, position to the lower left corner of the zoom cursor to the scanner coordinates 0.0, -2.0. The corresponding C-scan graphics screen image shown in Figure 2. Select the analyze function to initiate the spectral analysis. As the FFT is performed on each RF waveform, a spectral color is assigned and displayed, both in the zoom cursor and the magnification window.

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Move the zoom cursor, resize it and the magnification window, and analyze another region by again selecting the analyze function. Alternate between spectral display on and off by repeatedly selecting the toggle function.

While the data for Spectral C-scan is being calculated, it is also written to disk as a .Sn file. Exit the C-scan display and the re-enter it from the Data Analysis menu. Note that the spectral analysis regions are no longer displayed when the spectral mode is toggled on and off. To retrieve from disk and display the spectral data that has already been computed, select the read function. If desired, additional regions may be analyzed and appended to the existing spectral data file stored on disk. In this manner, it is possible to perform incremental analysis of a data set over several analysis sessions.

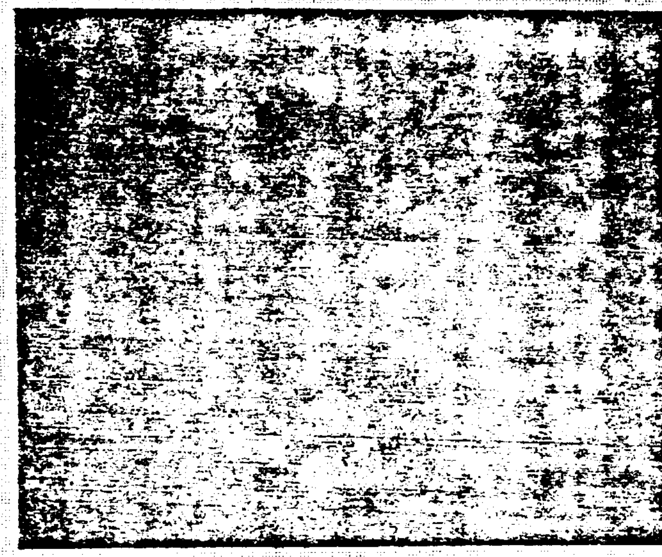
TPS NO. C01-0471-00-001-0005
CONTROL NO. 4A156

```
IN   SPECT/98 VIP REV D  RDAS E8  SC5C        AMDATA INC., (C) 1987
AMDATA TEST BLOCK           FORM: MSTP... CH: 1     12/22/86  18:56-18:58
X:  -0.50" ->   0.35" BY 0.05"    AXIAL SCAN  ANG: 45.00  GAIN:  0.00 DB
Y:   0.00" ->  -4.00" BY 0.05"    DAC: OFF    SK :  0.00  MINUS WELDSIDE
AMP:         % FSH    MP:      "                GATE      DELAY    WIDTH
TOF:           US     DP:      "                A (US)    20.00    51.20
SC(X,Y)=( -0.50,  0.00)       AMPLITUDE         C (US)    20.00    12.80
```

-12%
-18%
19-24%
25-31%
32-37%
38-43%
44-50%
51-99%
100-100%

SPECTRAL

< 10000
< 20000
< 30000
< 40000
< 500000
< 600000
< 700000
< 800000
< 999999



MODE = NORMAL
CURSOR YLENGTH = 0.5 INCHES
CURSOR XLENGTH = 0.8 INCHES
XMAGNIFICATION = 24 TIMES
YMAGNIFICATION = 32 TIMES

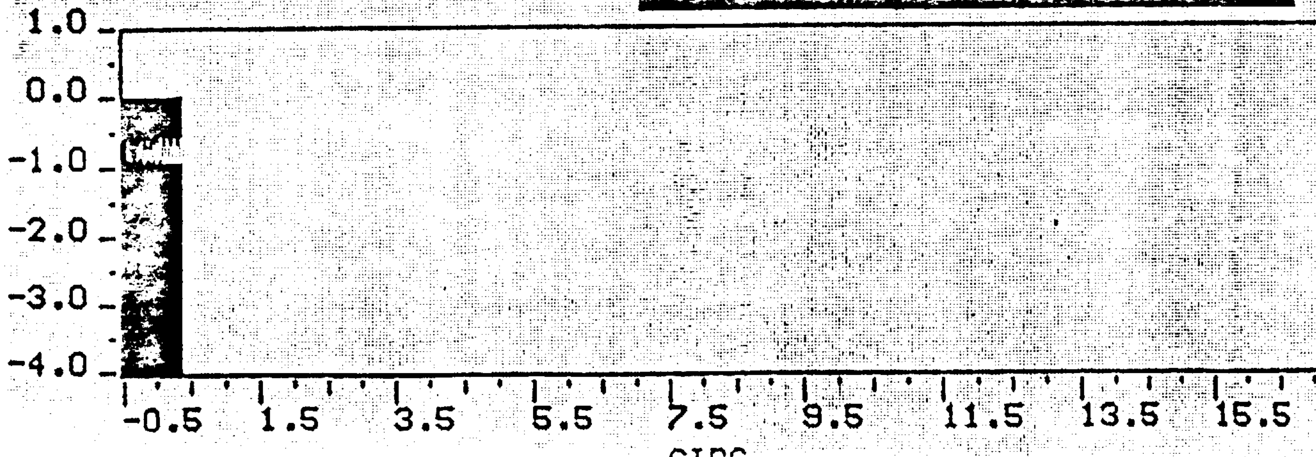


Figure 1

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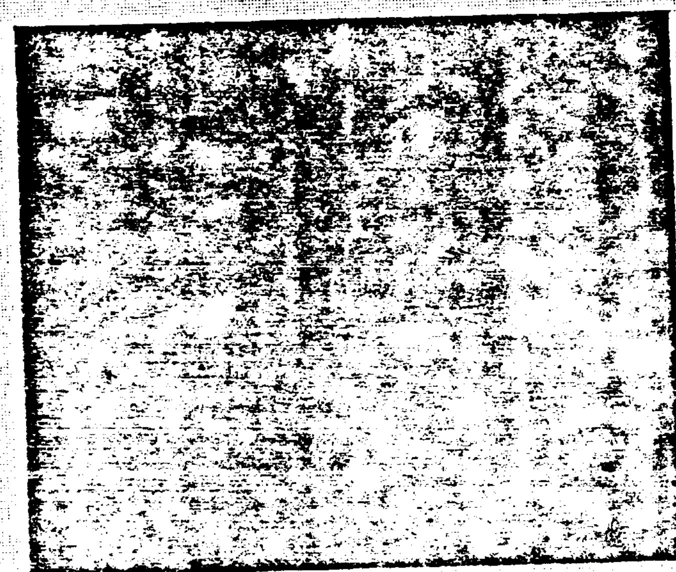
```
INT. .PECT/98 VIP REV D  RDAS E8   SC505       AMDATA INC., (C) 1987
AMDATA TEST BLOCK          FORM: MSTPAUS CH: 1    12/22/86  18:56-18:58
X:  -0.50" ->   0.35" BY 0.05"    AXIAL SCAN  ANG: 45.00  GAIN:  0.00 DB
Y:   0.00" ->  -4.00" BY 0.05"    DAC: OFF    SK :  0.00  MINUS WELDSIDE
AMP:          % FSH   MP:      "                GATE     DELAY    WIDTH
TOF:            US    DP:      "                A (US)   20.00    51.20
SC(X,Y)=( -0.50,  0.00)        AMPLITUDE        C (US)   20.00    12.80
```

12%
-18%
19-24%
25-31%
32-37%
38-43%
44-50%
51-99%
100-100%



SPECTRAL

< 10000
< 20000
< 30000
< 40000
< 500000
< 600000
< 700000
< 800000
< 999999

MODE = SPECTRAL

CURSOR YLENGTH = 0.5 INCHES

CURSOR XLENGTH = 0.8 INCHES

XMAGNIFICATION = 24 TIMES

YMAGNIFICATION = 32 TIMES

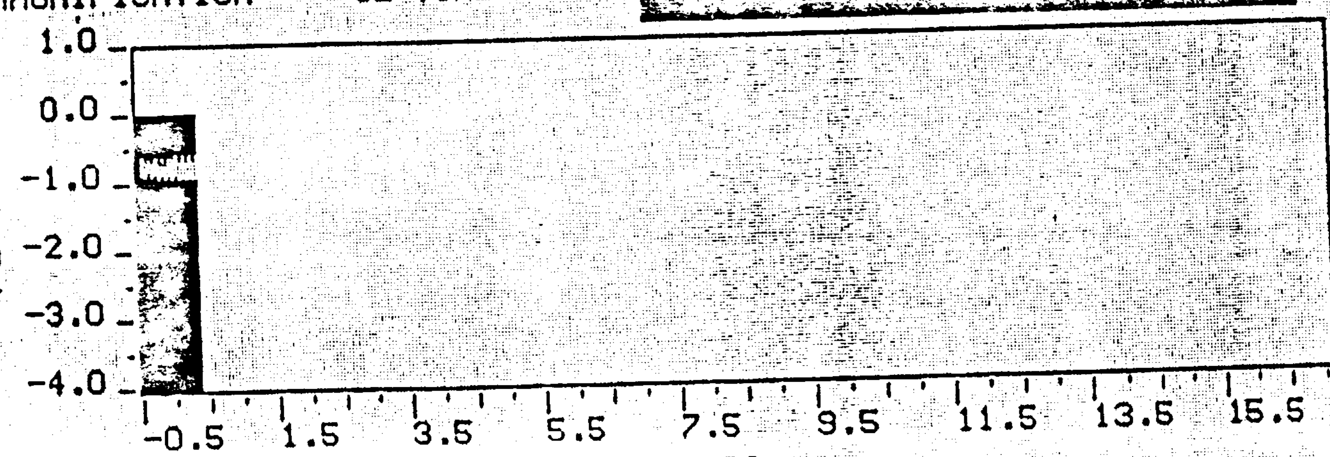


Figure 2

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TPS NO. C77-0479-00-001-0005

TEST SET UP

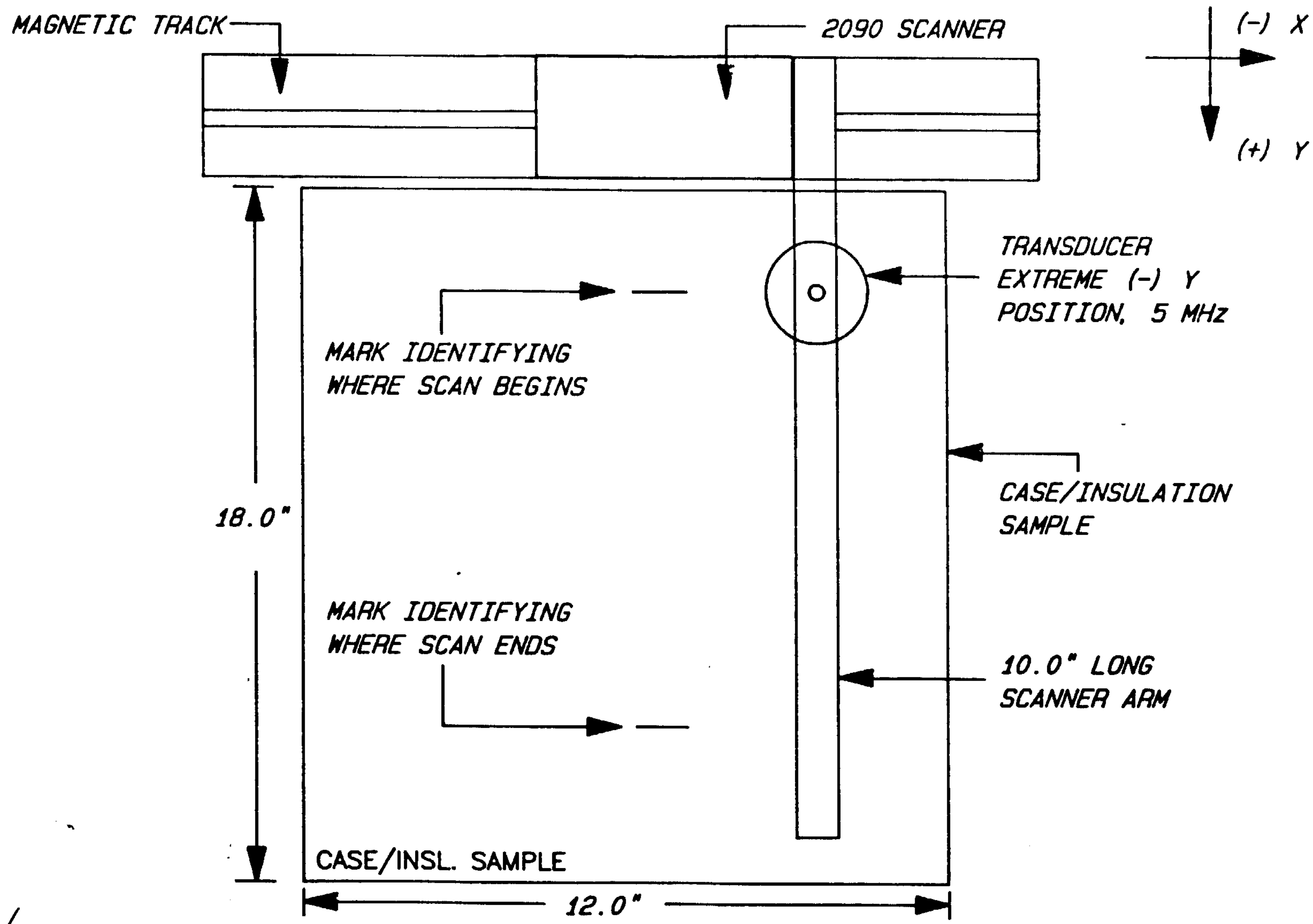

FIGURE 1: Y–AXIS TRANSDUCER POSITION ACCURACY

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TEST SET UP

CONTROL NO. 4A156
TPS NO. C77-0479-00-001-0005

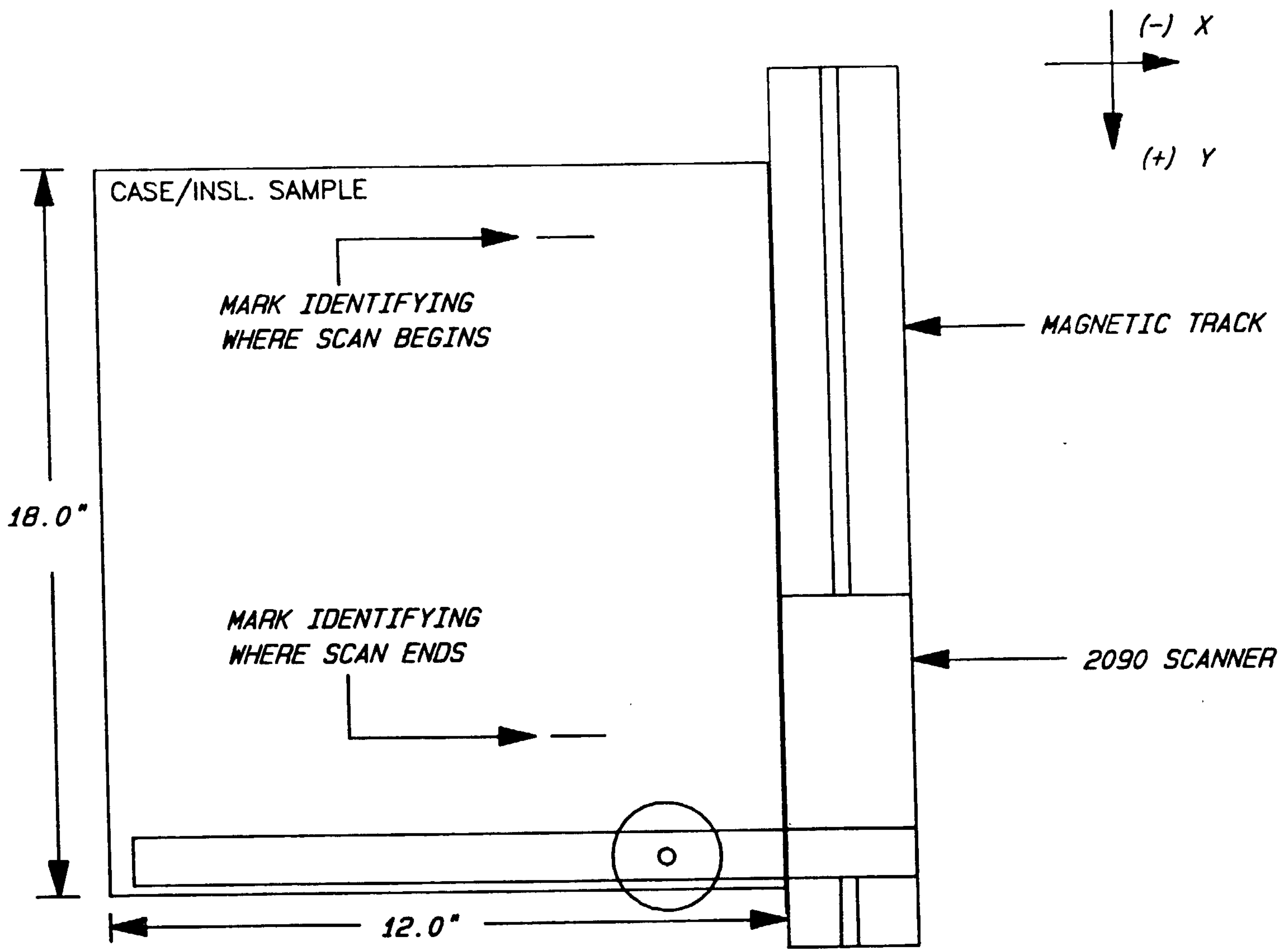


FIGURE 2: X-AXIS TRANSDUC—, POSITION ACCURACY

CONTROL NO. 4A156
TPS NO. C77-0479-00-001-0005

SCAN SET UP

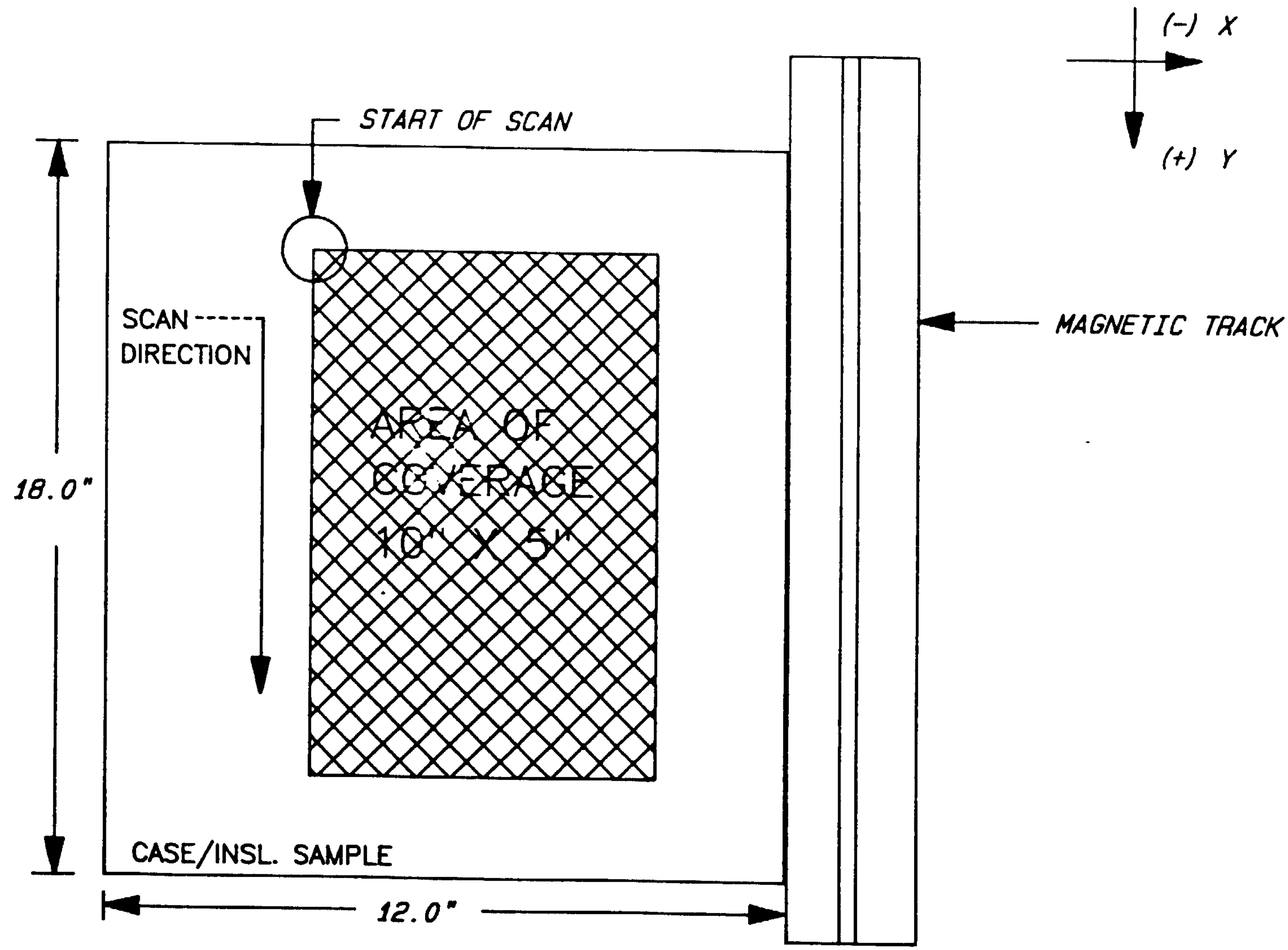


FIGURE 3: SCAN ?EA

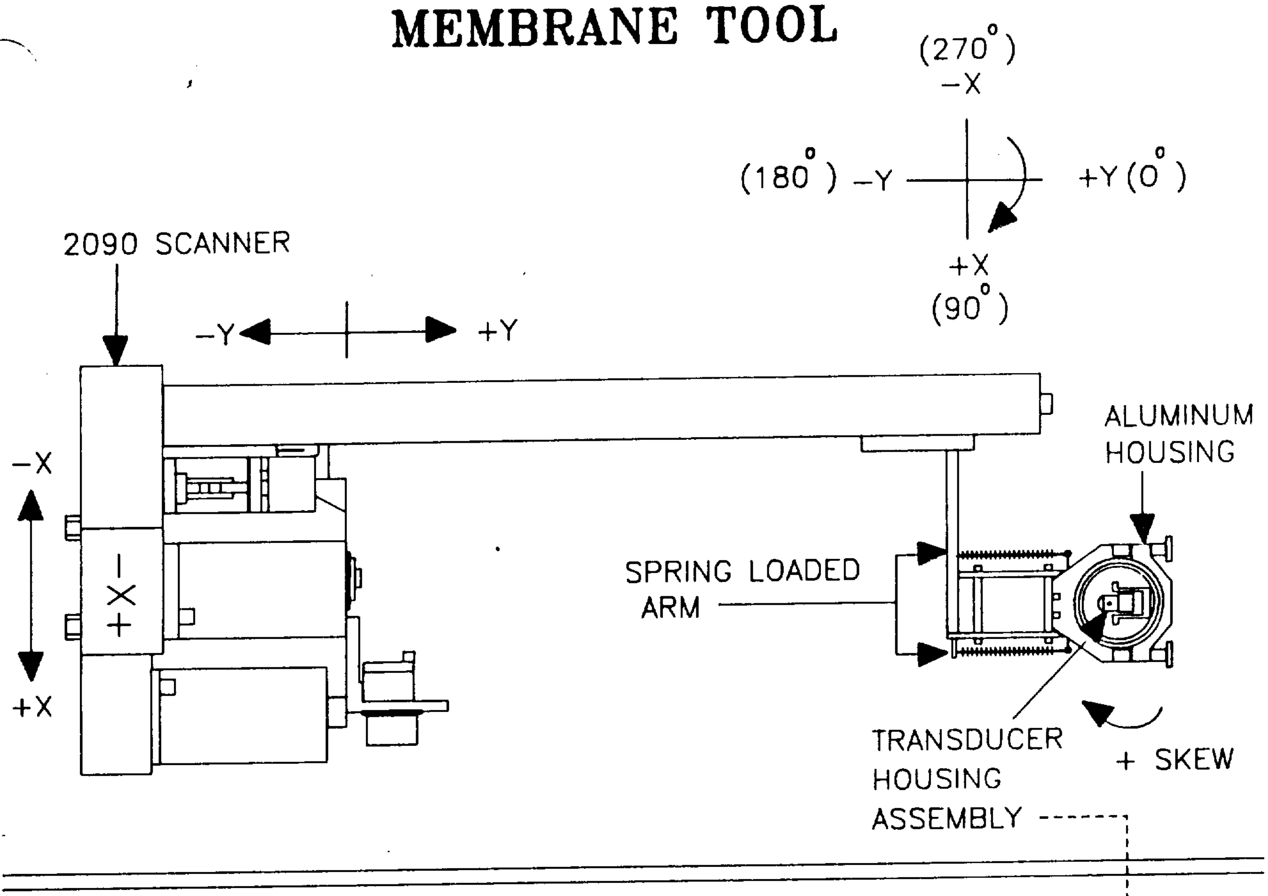
B Hardman TV-M60-24

GS 49 12APR84

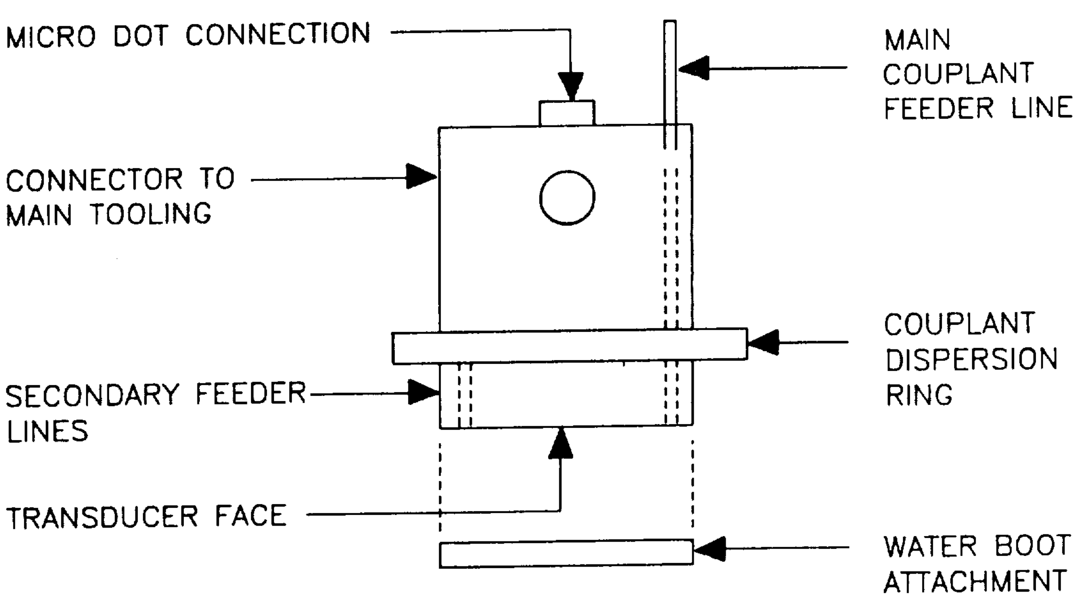
QE 086 SPC

CONTROL NO. 4A156
TPS NO. C77-0479-00-001-0005

MEMBRANE TOOL



TRANSDUCER HOUSING ASSEMBLY

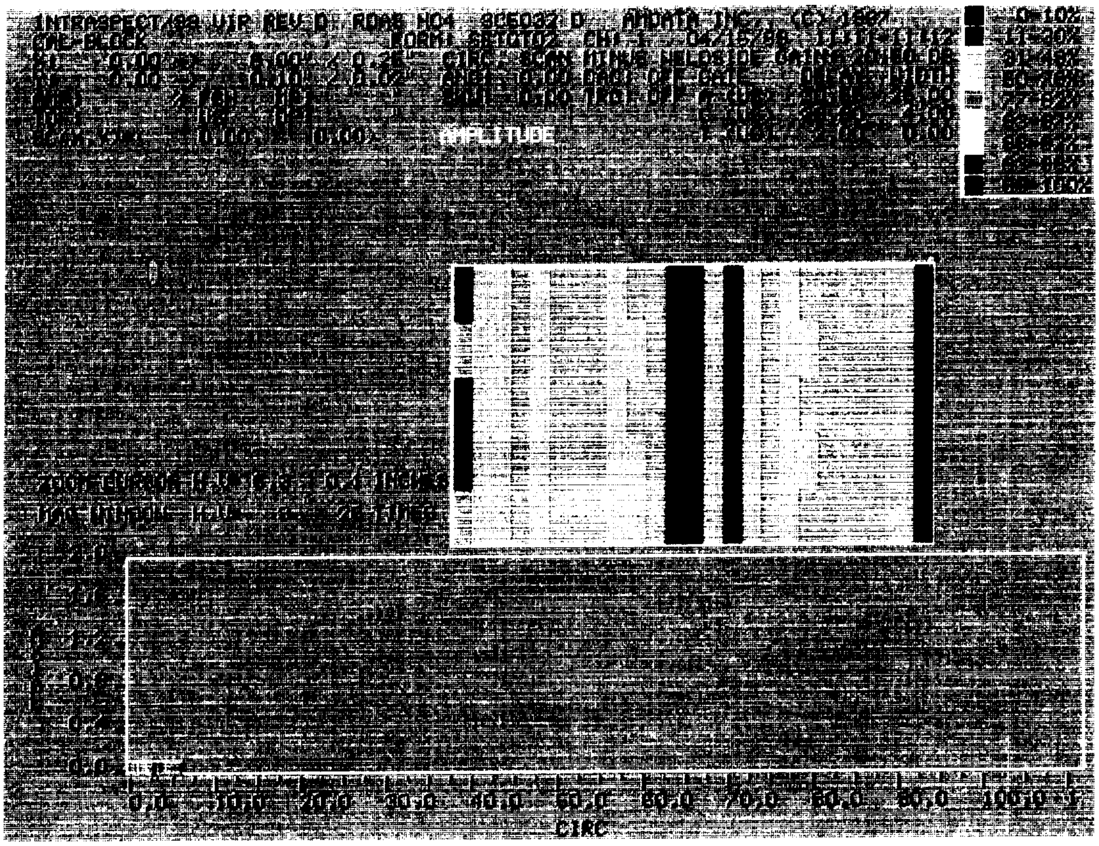


FIRURE 4: MEMBRANE TOOL

TV-MSD-24

TPS. NO. C71-0479-00-001-005

STEP. 5.✓



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TPS: C77-0479-C0-001-005
STEP. 8.4

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COLOR PHOTOGRAPH

RF MODE

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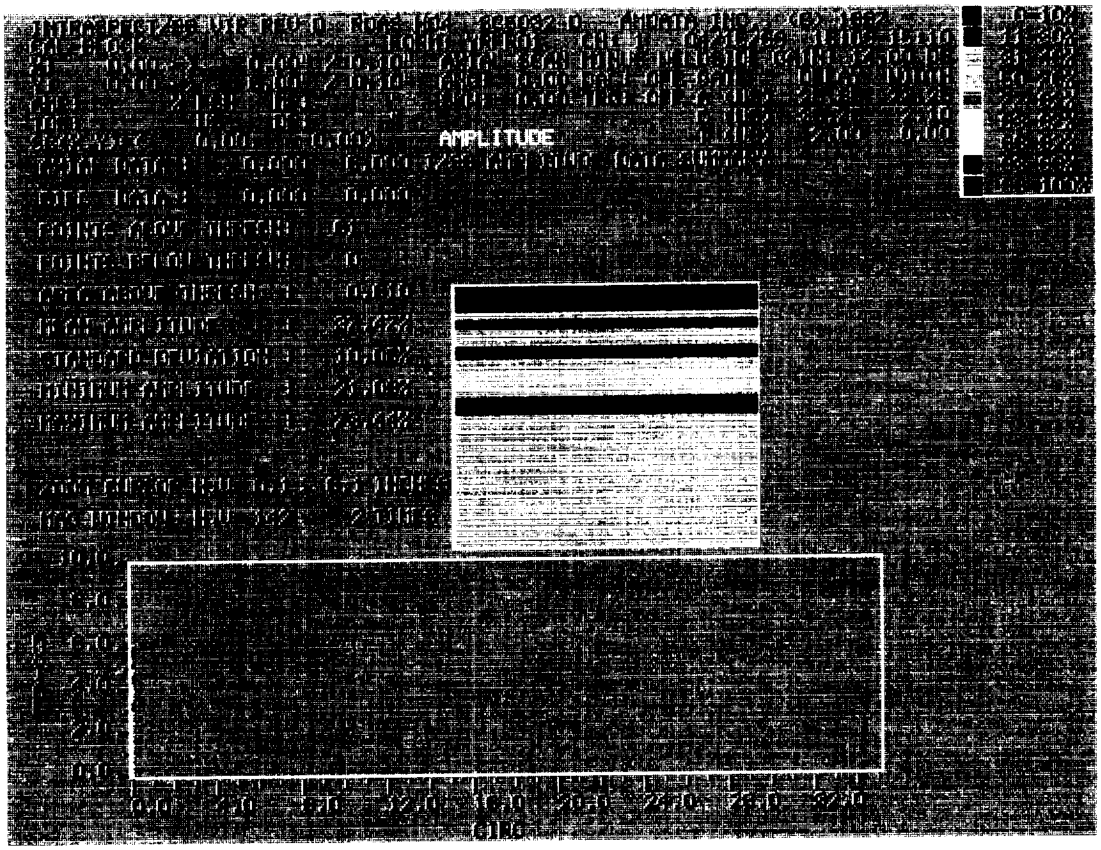

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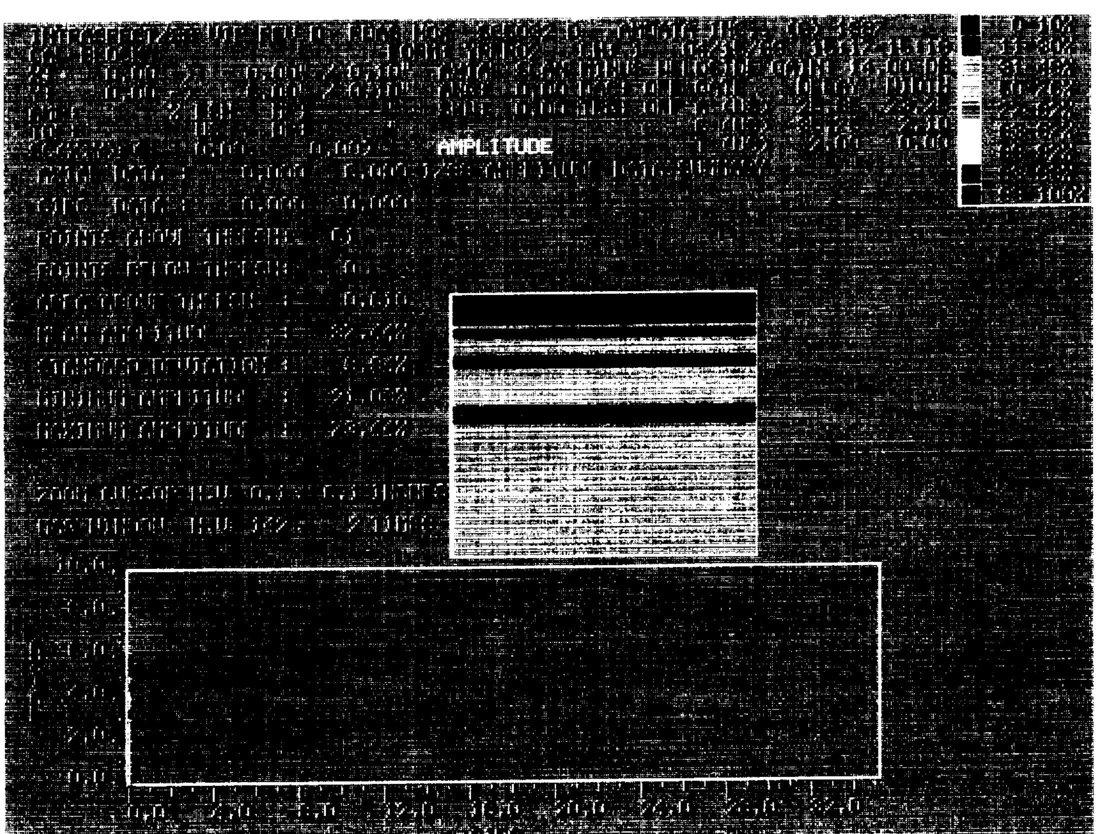
RUN 2



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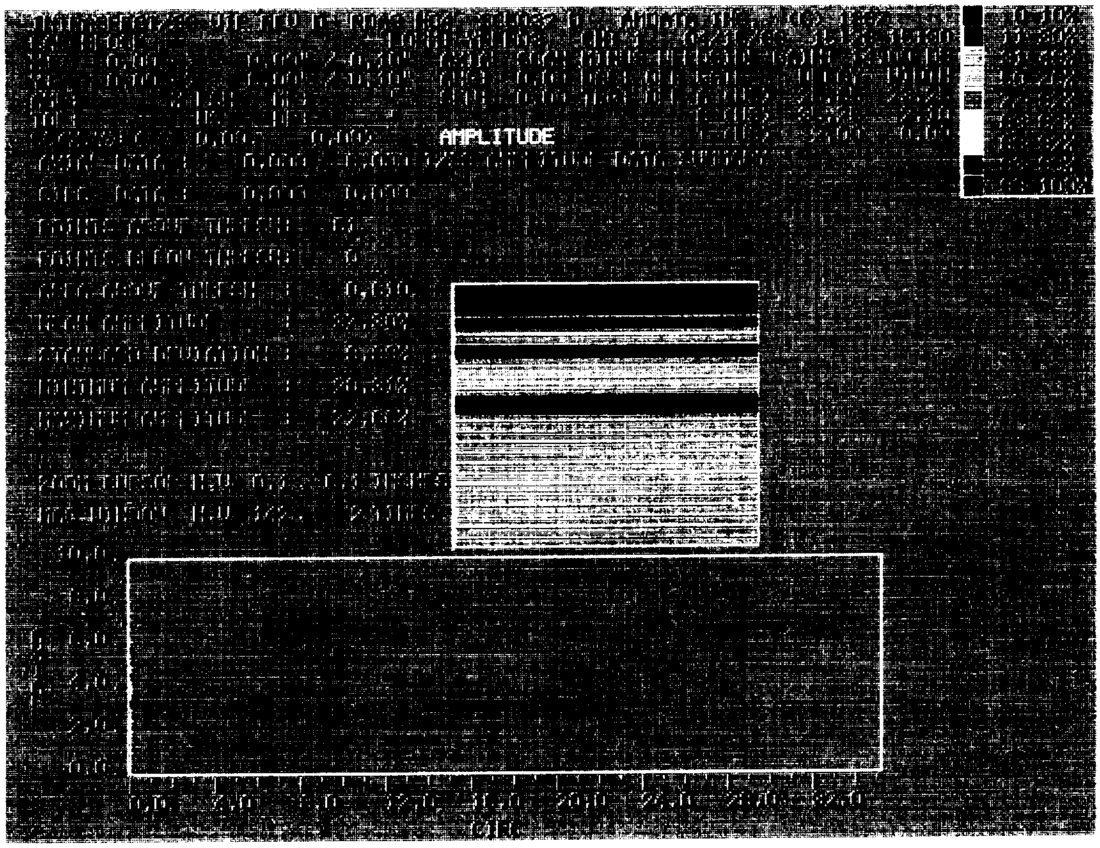
TPS: C77-0479-00-001-005

STEP: 8.4

RF MODE

RUN 3



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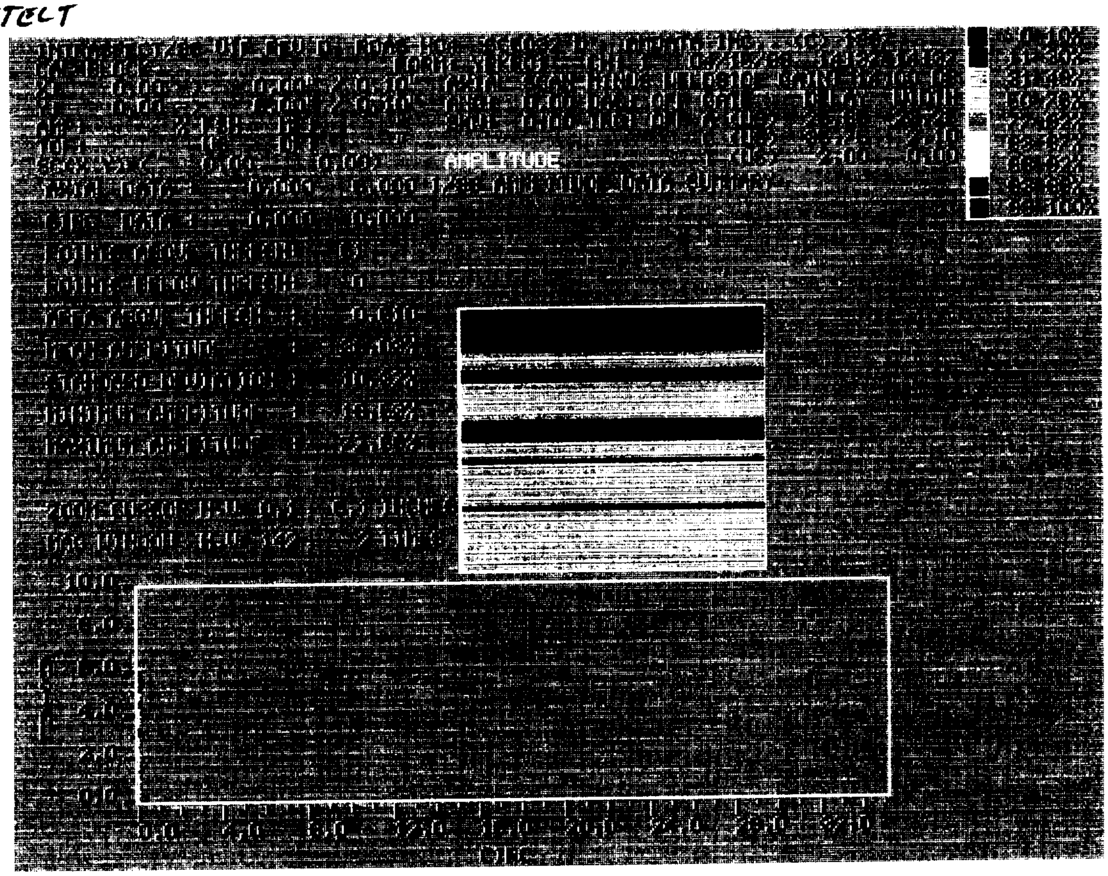
TPS.: C77-0417-00-001-00?

STEP. 8.2

PEAK DETECT

RUN 1



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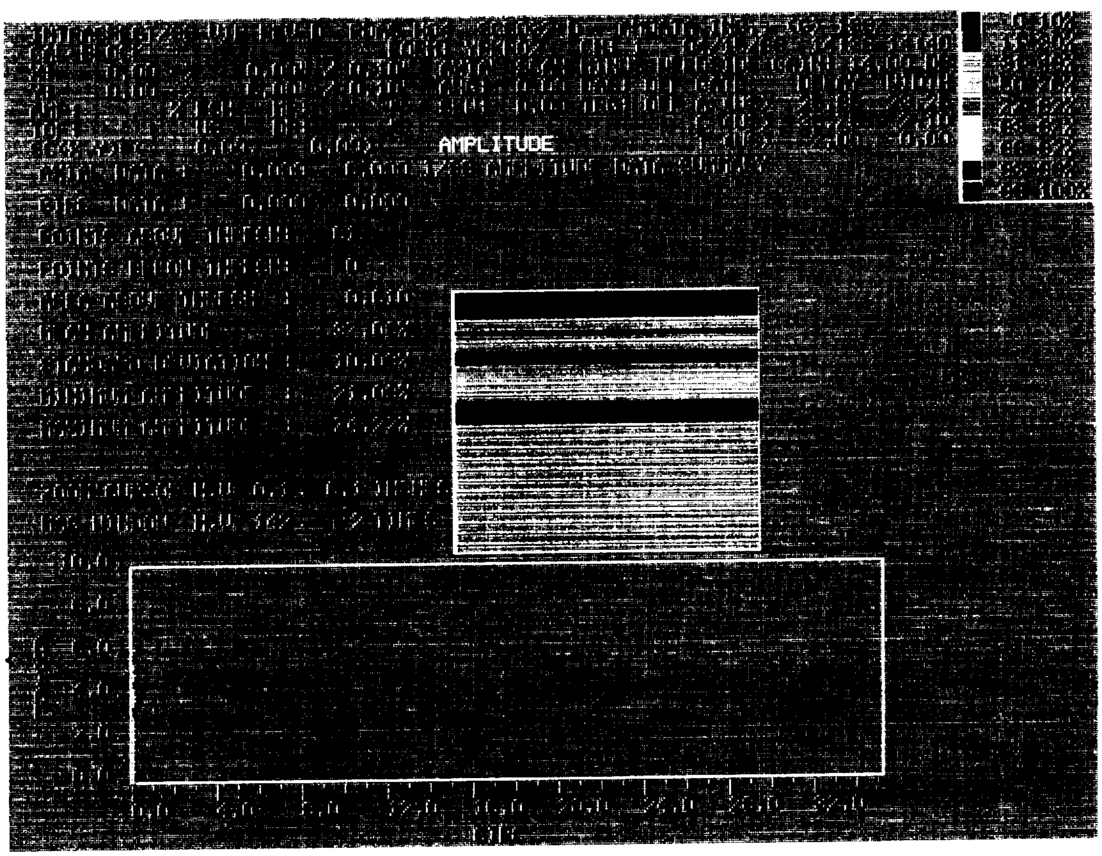

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TPS: C77-0479-00-001-005

STEP: 8-2

PEAK DETECT

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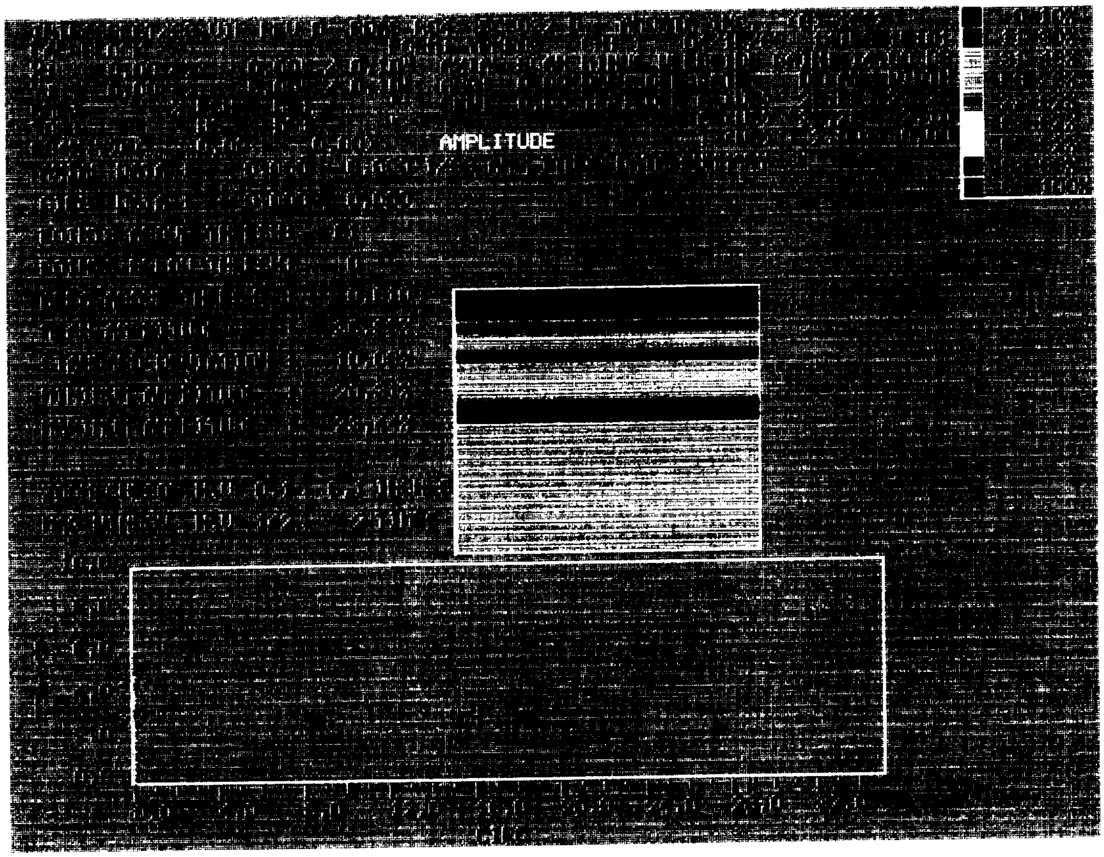

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13 APR 89
TPS C77-0479-00-001-0005
ITEM # 3.9

I/98 QUALIFICATION TEST

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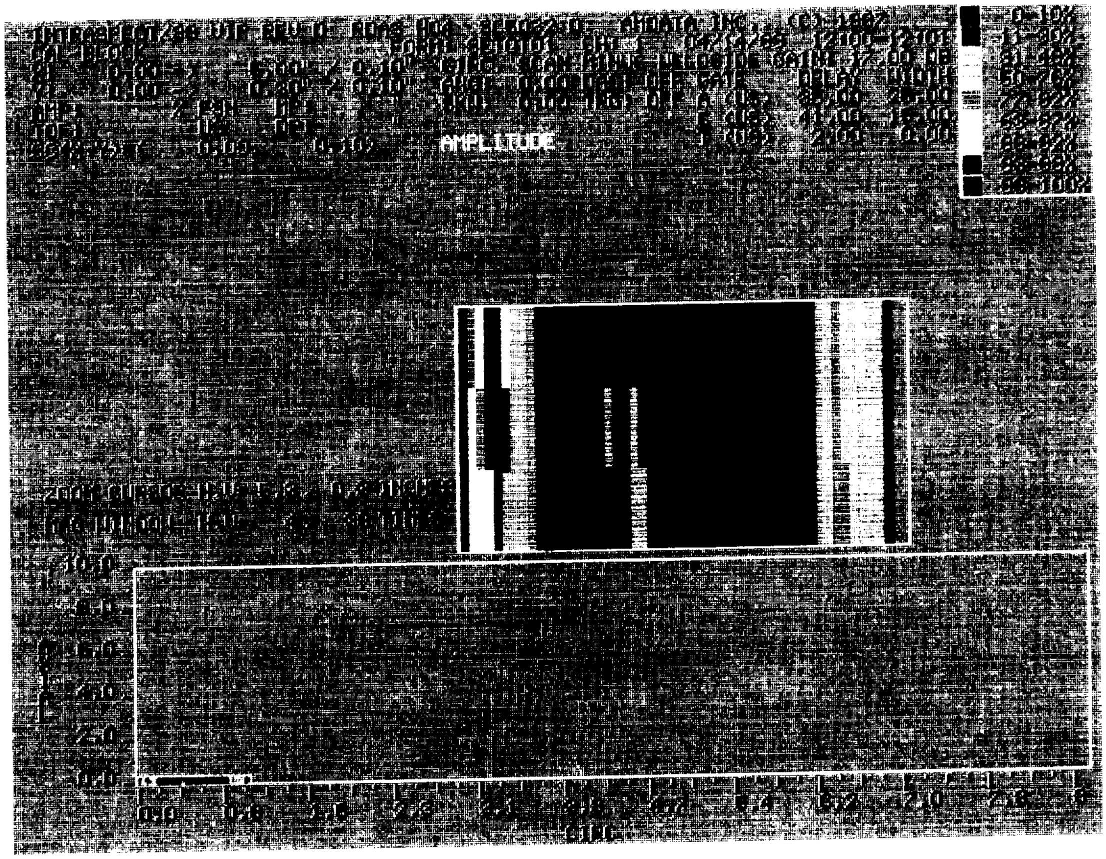

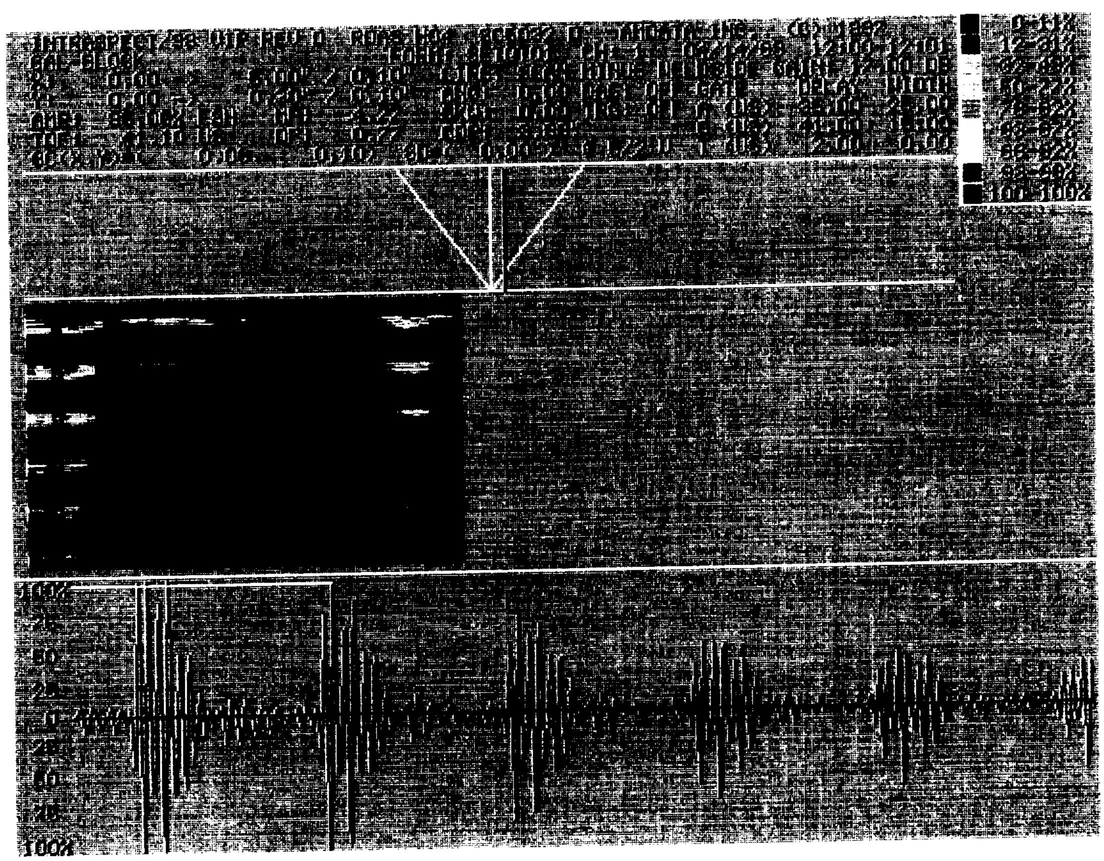

4 APR 89
PS-C77-0479-00-001-005
ITEM # 9.2

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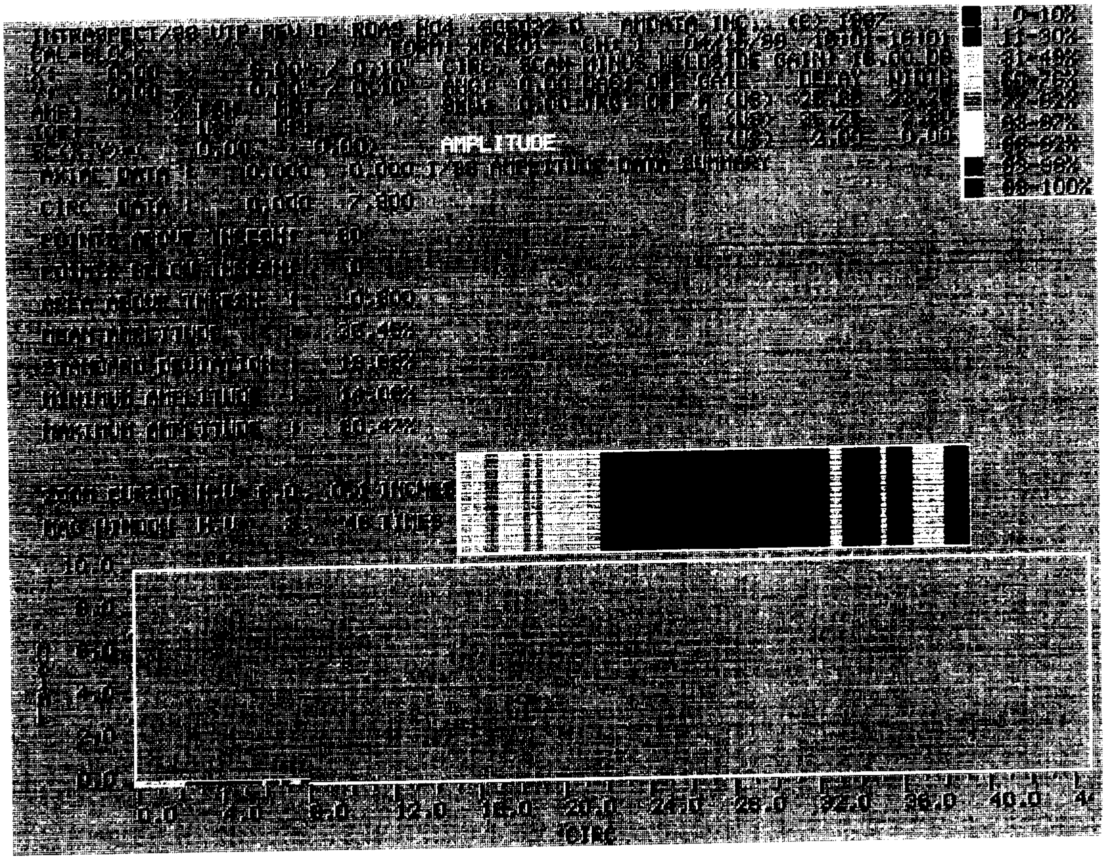
X-SCANNING VELOCITY VERIFICATION (PEAK MODE)



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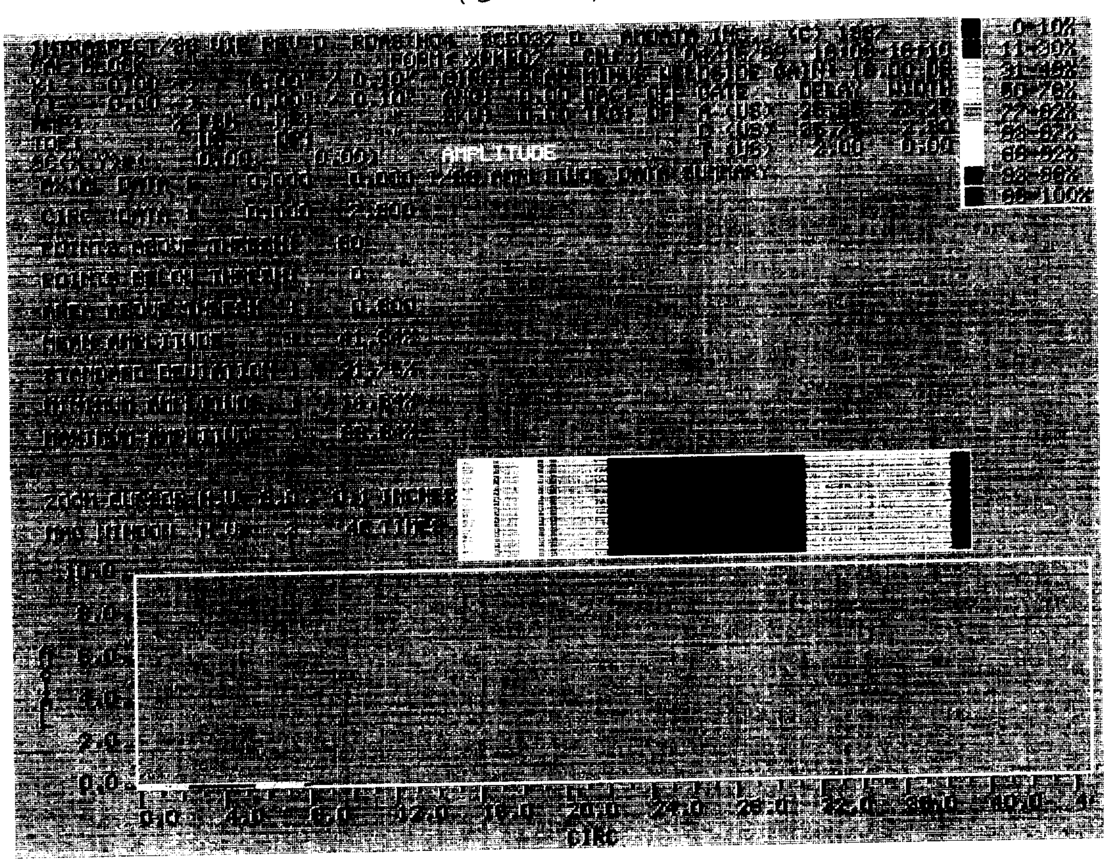

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4 APR 89
PS-C77-0479-00-001-005
ITEM #92

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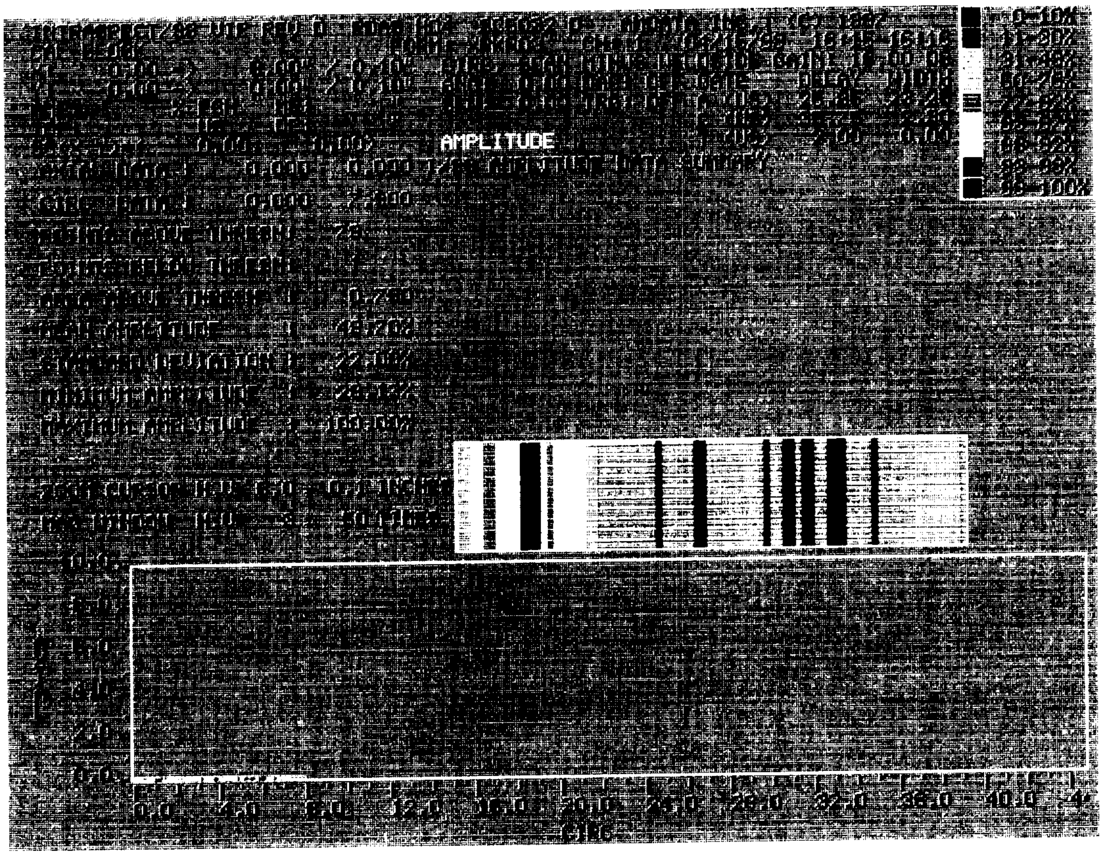

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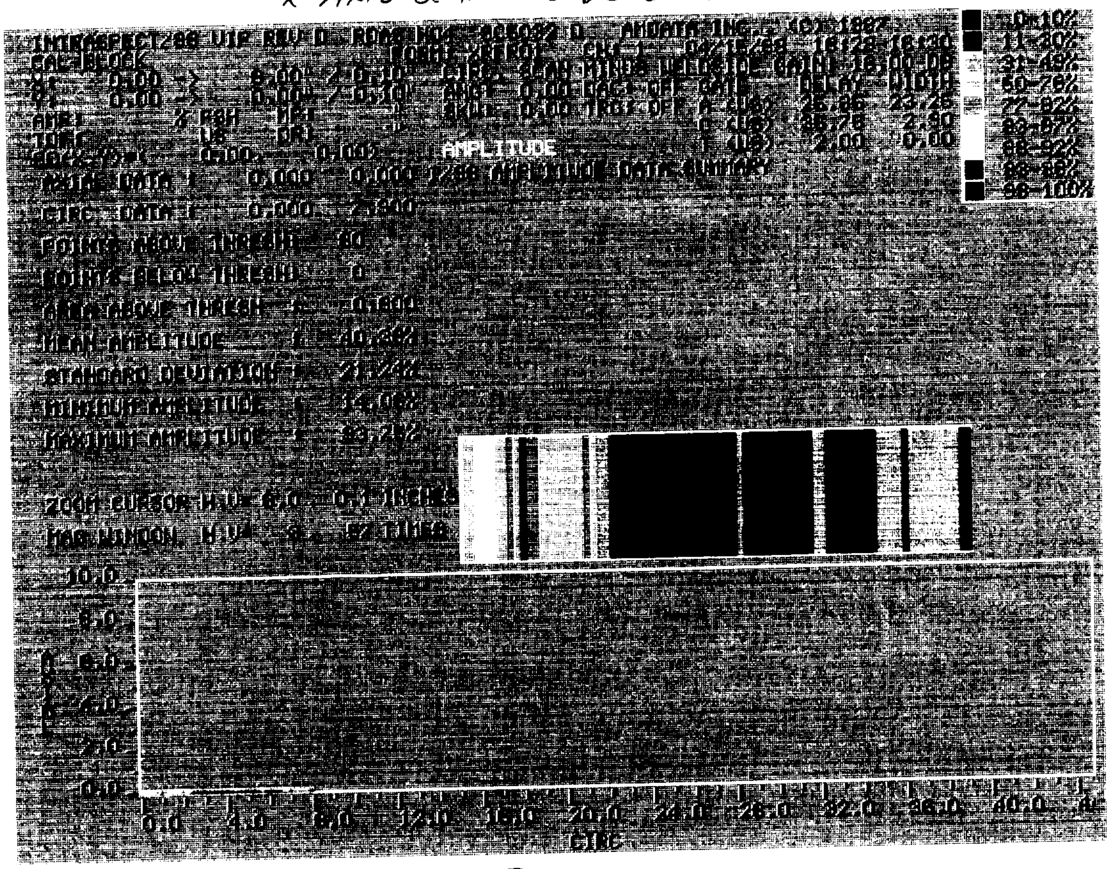
1 APR89
PS # C17-0479-00-001-005
TEM # 9.4

X-AXIS SCANNING VELOCITY VERIFICATION (RF MODE)



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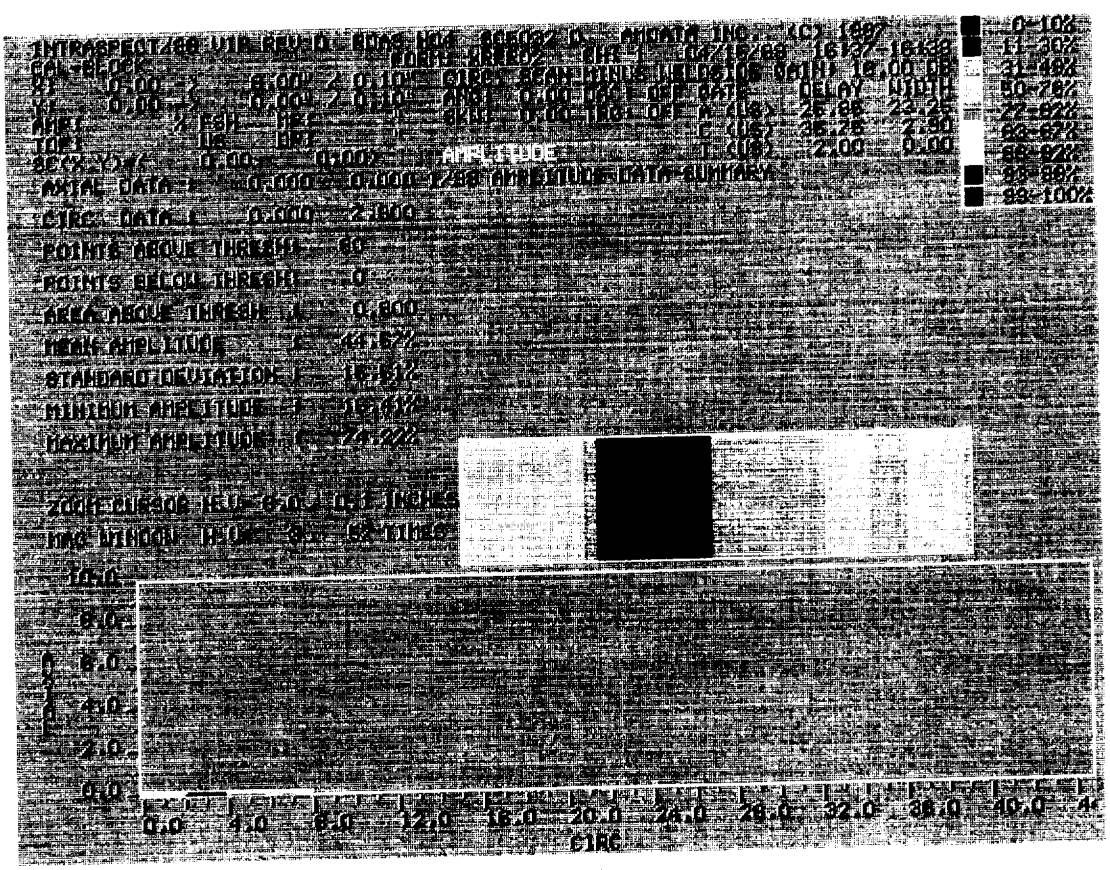

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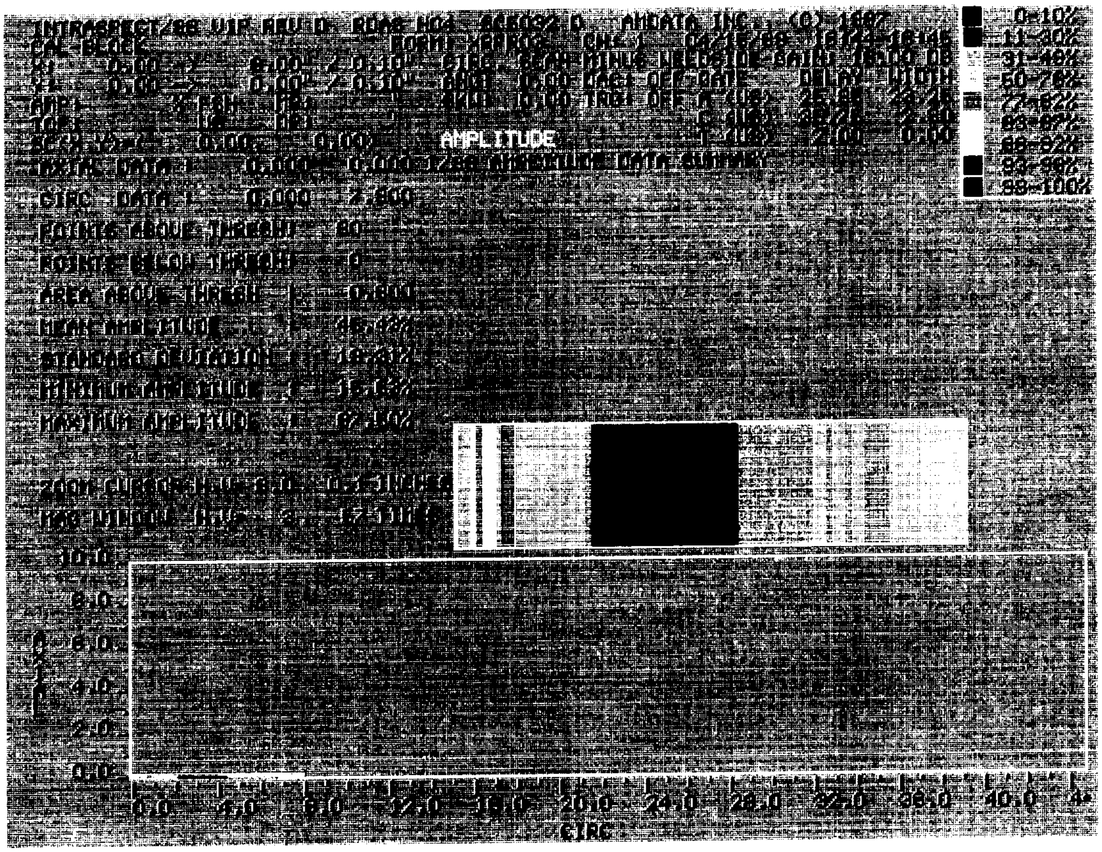
PS # C77-0479-00-001-005
ITEM 9.4

X-AXIS SCANNING VELOCITY VERIFICATION (RF MODE)



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14 APR 89
TPS # C77-0479-00-001-005
Item # 10.6

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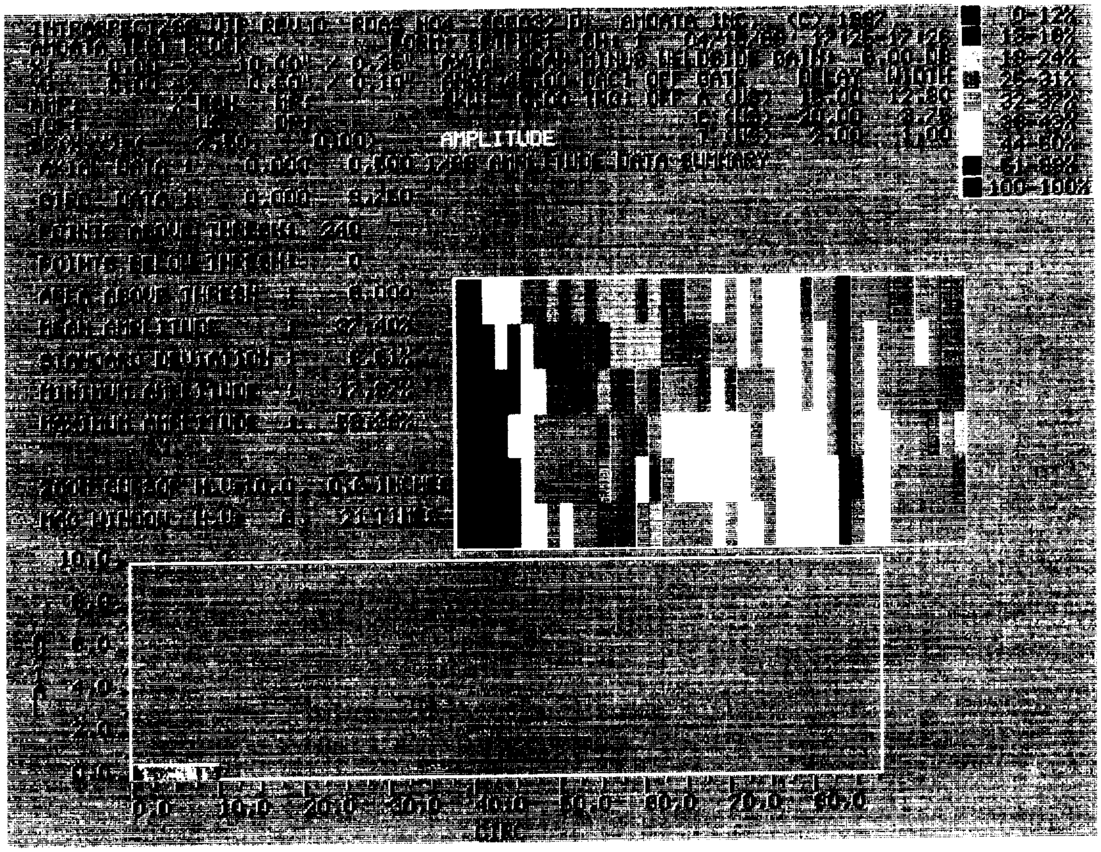
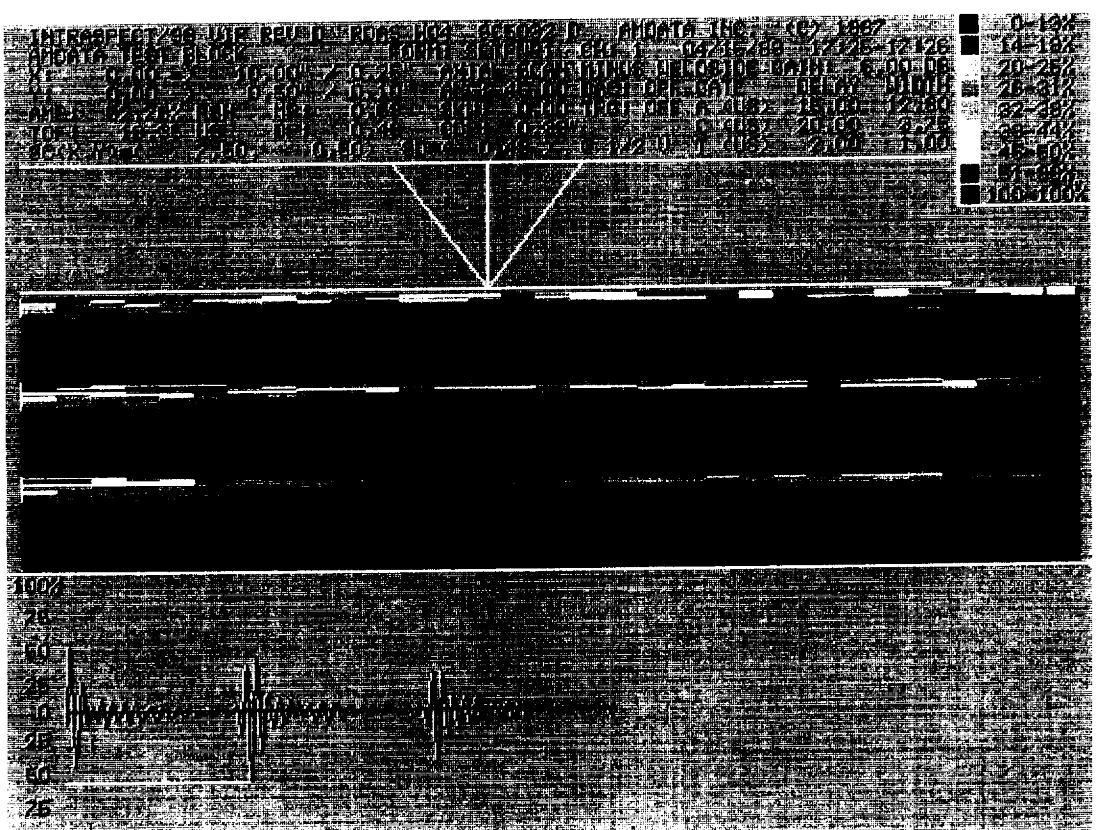
UNINTERUPTIBLE POWER SUPPLY VERIFICATION





14APR89
TPS C77-0479-00-001-005
ITEM # 10.6

RUN #2

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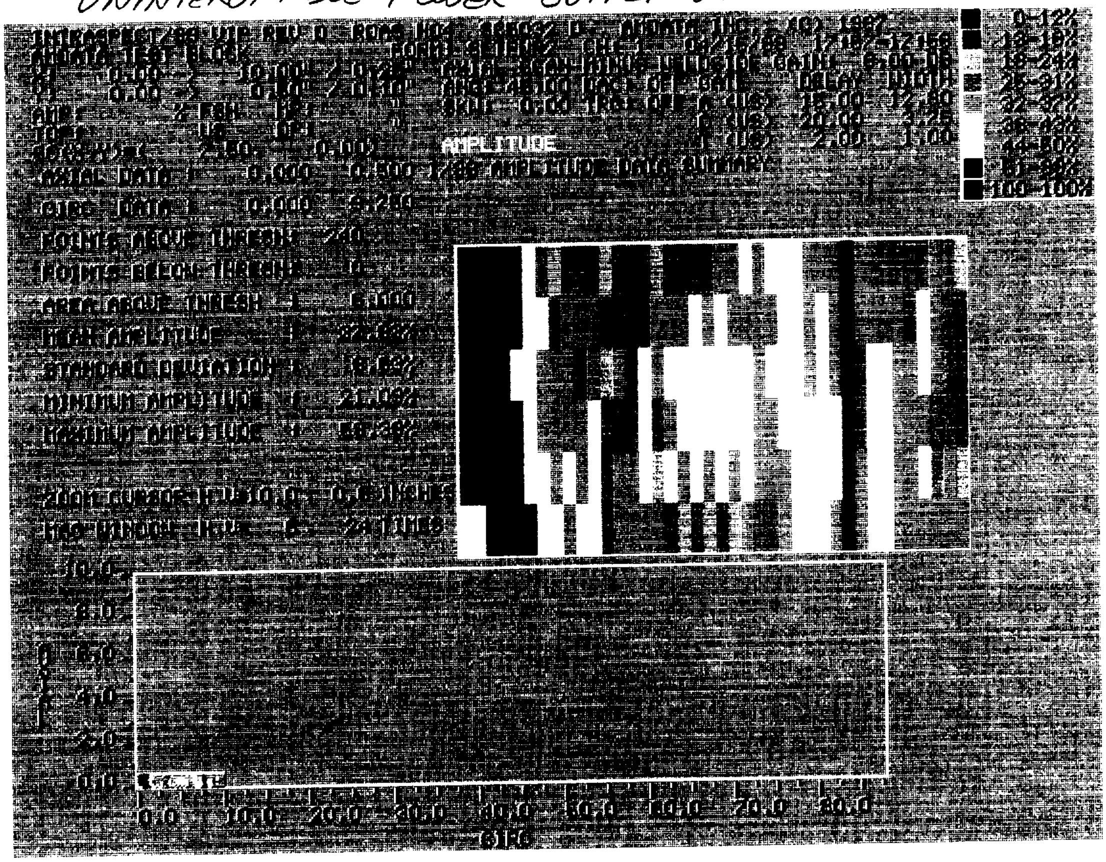
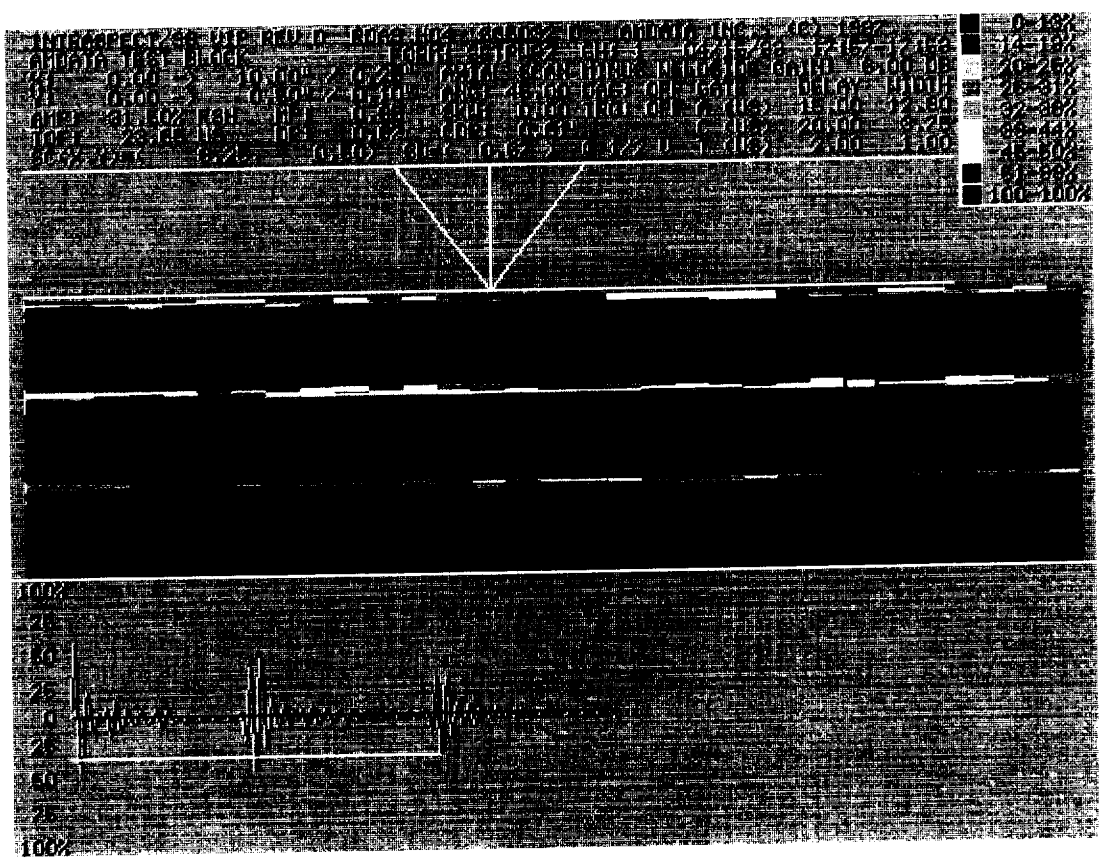
UNINTERUPTIBLE POWER SUPPLY VERIFICATION





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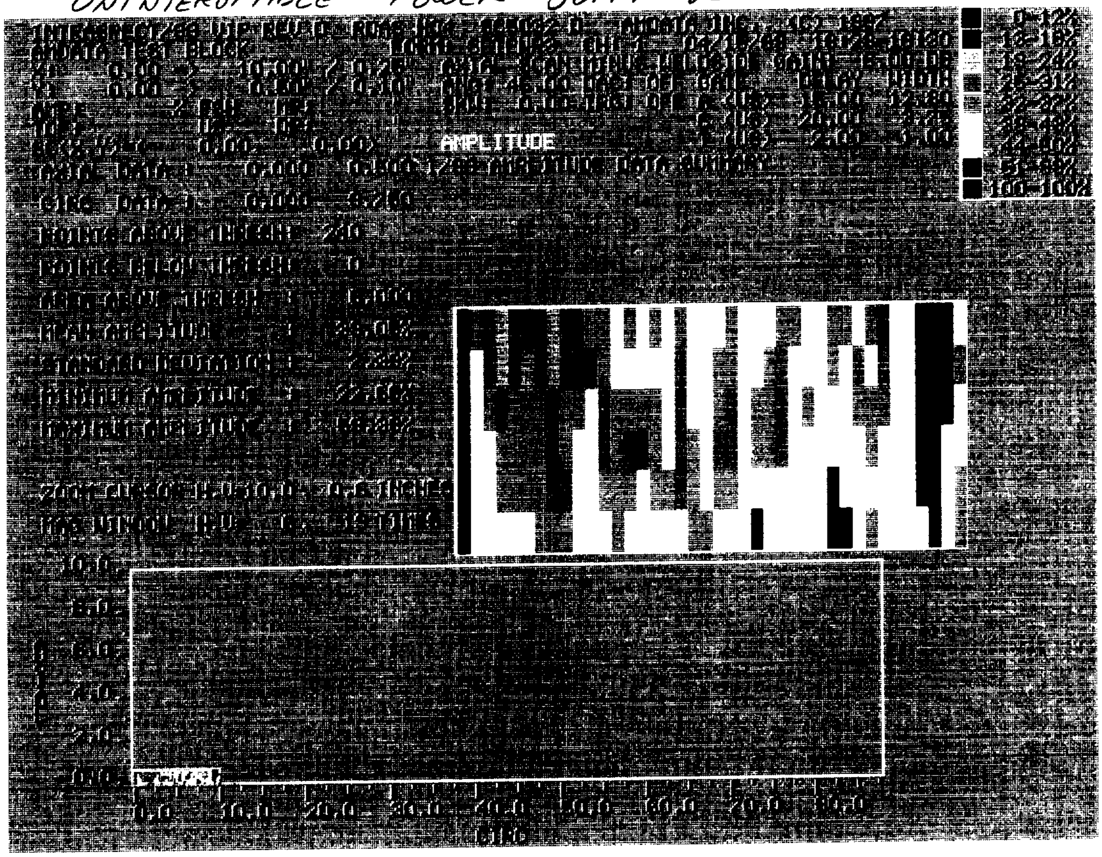
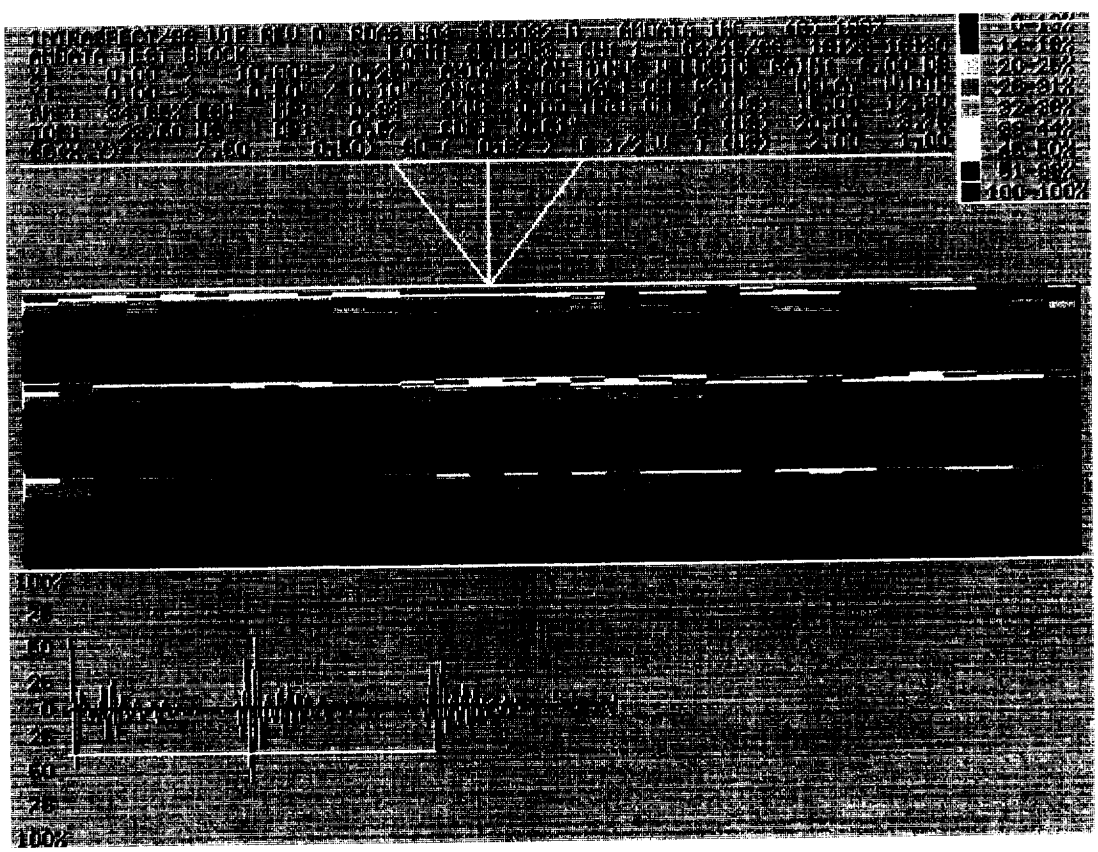
19APR87
TPS# 077-0479-00-001-005

RUN #3

ITEM # 10.6

UNINTERUPTIBLE POWER SUPPY VERIFICATION





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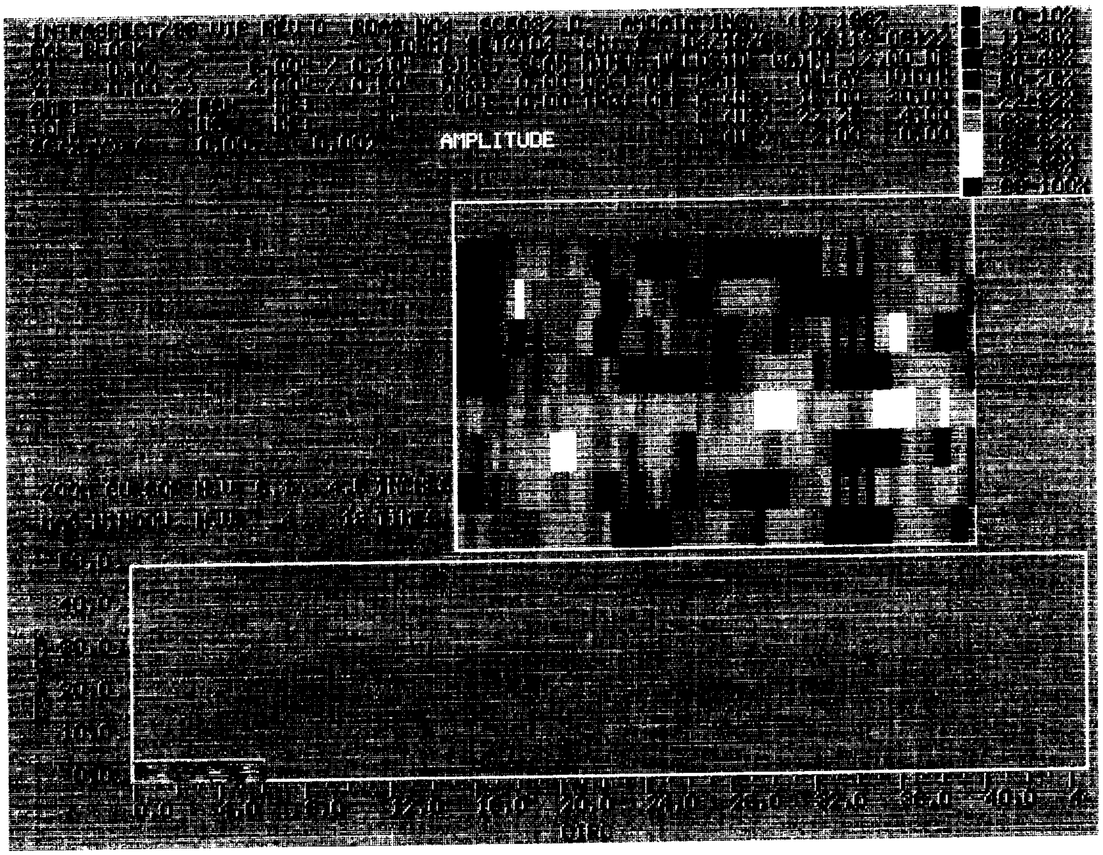
4/17/89 TPS. C77-0479-00-001-005

STEP 11.5



Type ALPHA   Minimum n/a   Maximum n/a

COLOR PALETTE

Colors 1 - 3

Display	BLACK	BROWN	RED
(R,G,B)	0 0 0	0.45 0.25 0.0	0.8 0.0 0.0
Seiko	BLACK BLACK	BLACK MAGENTA	RED RED
	BLACK BLACK	BLUE RED	RED RED
PJ (R,G,B)	4 4 6	12 8 10	53 08 14

Colors 4 - 6

Display	ORANGE	ORANYELLOW	YELLOWORAN
(R,G,B)	1.00 0.40 0	.98 0.6 0.0	1.0 0.8 0
Seiko	RED WHITE	YELLOW RED	YELLOW RED
	WHITE RED	RED YELLOW	YELLOW YELLOW
PJ (R,G,B)	62 21 13	72 41 13	74 45 22

Colors 7 - 9

Display	YELLOW	WHITE	SATURATED
(R,G,B)	1.0 1.0 0.0	1.0 1.0 1.0	1.0 0.0 1.0
Seiko	YELLOW YELLOW	WHITE WHITE	MAGENTA MAGENTA
	YELLOW YELLOW	WHITE WHITE	MAGENTA MAGENTA
PJ (R,G,B)	89 83 13	90 88 85	53 5 25

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Page: 11

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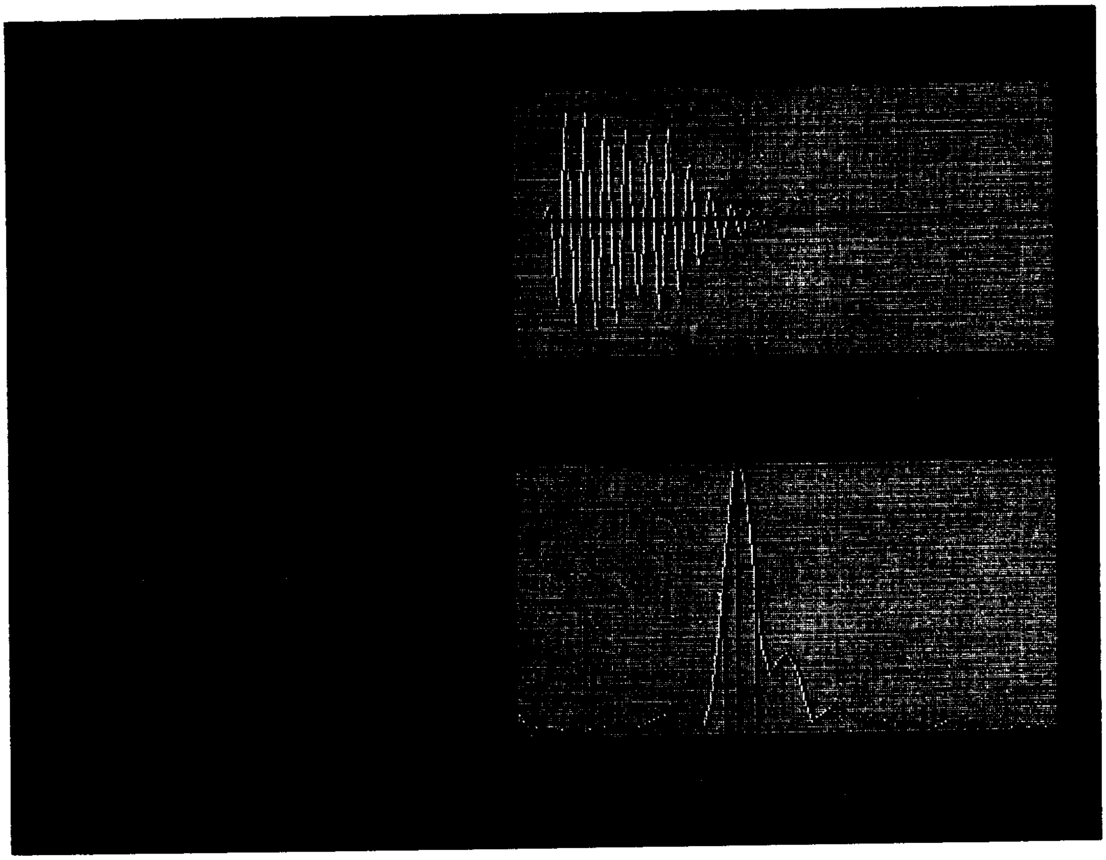

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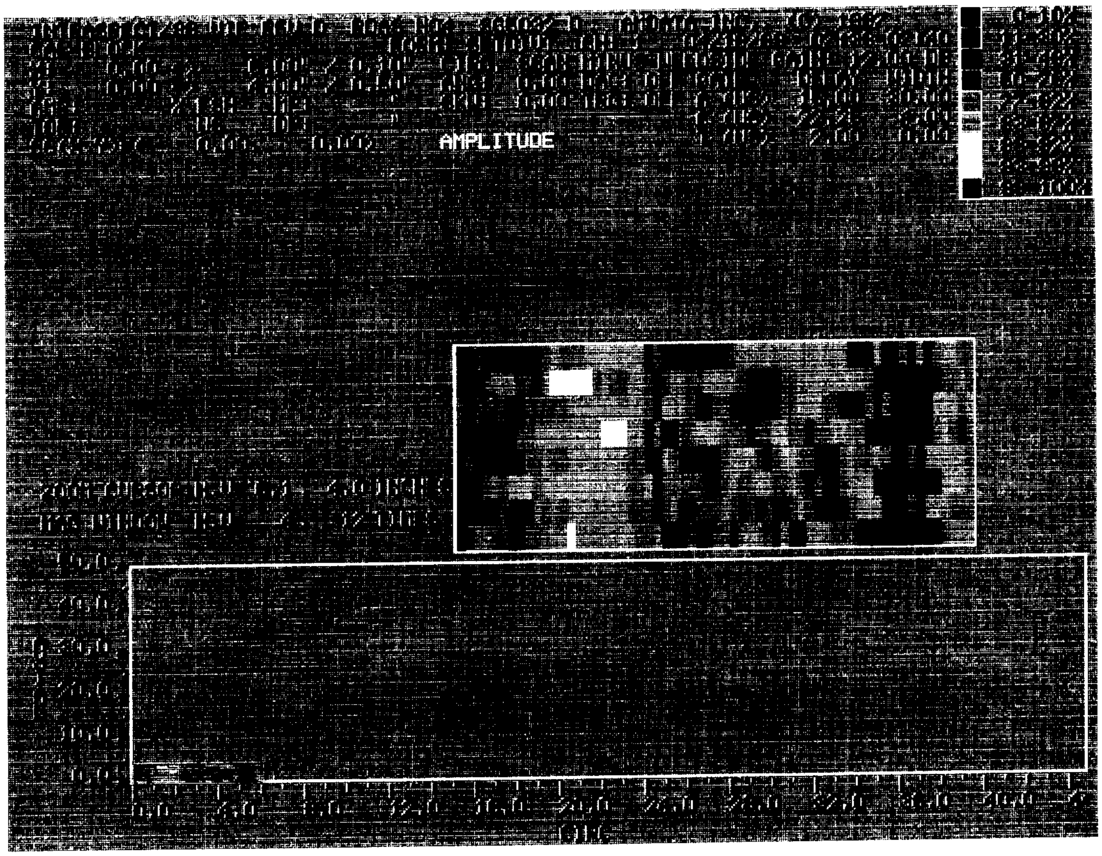

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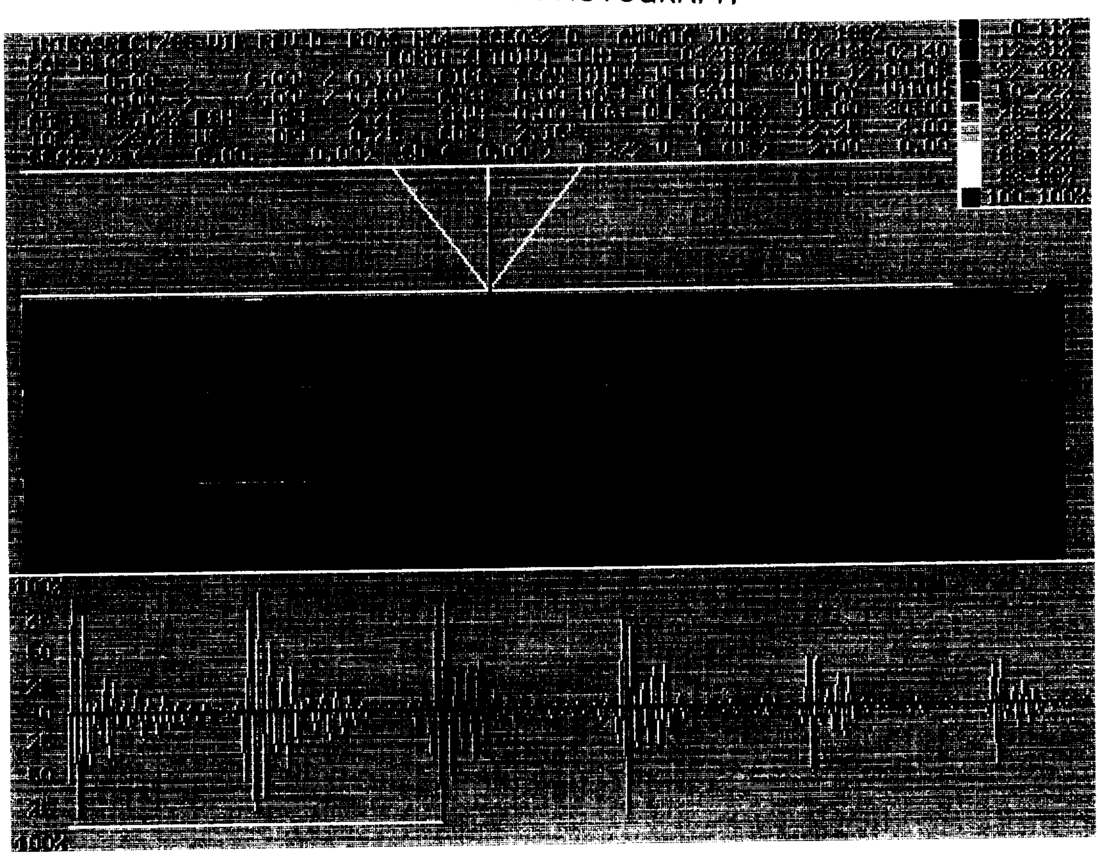

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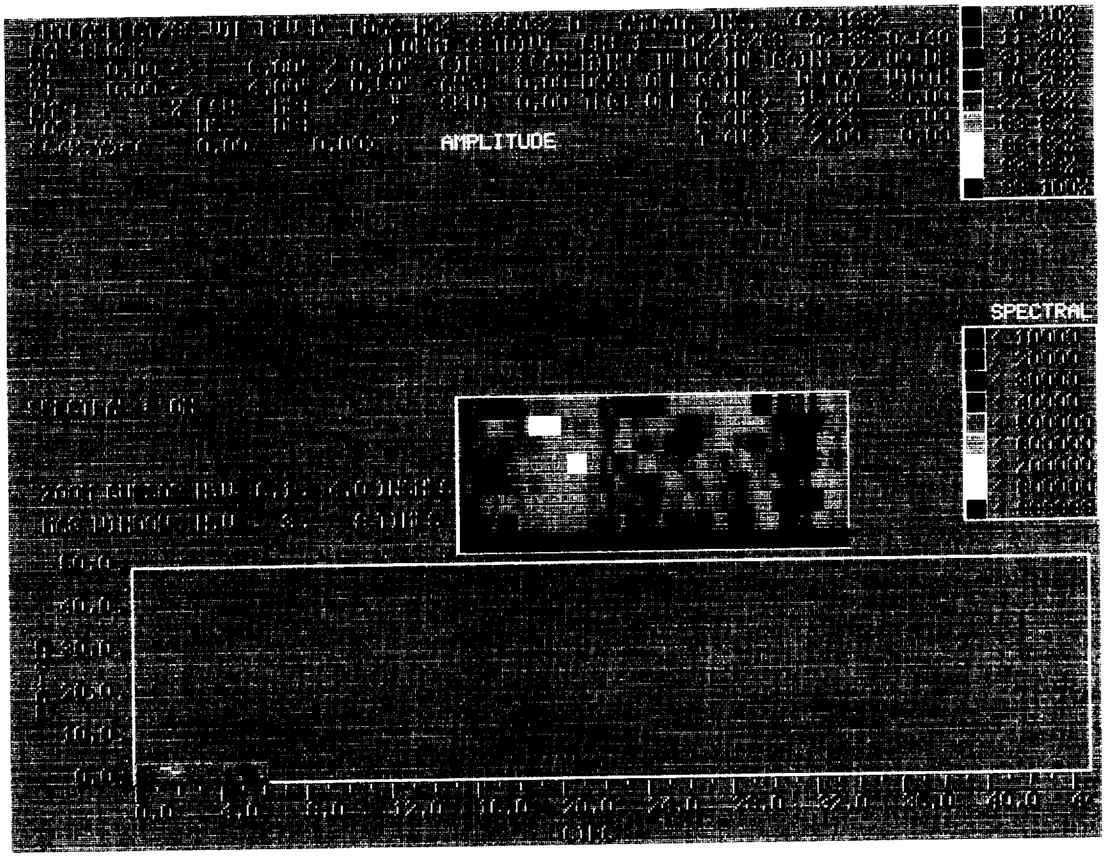

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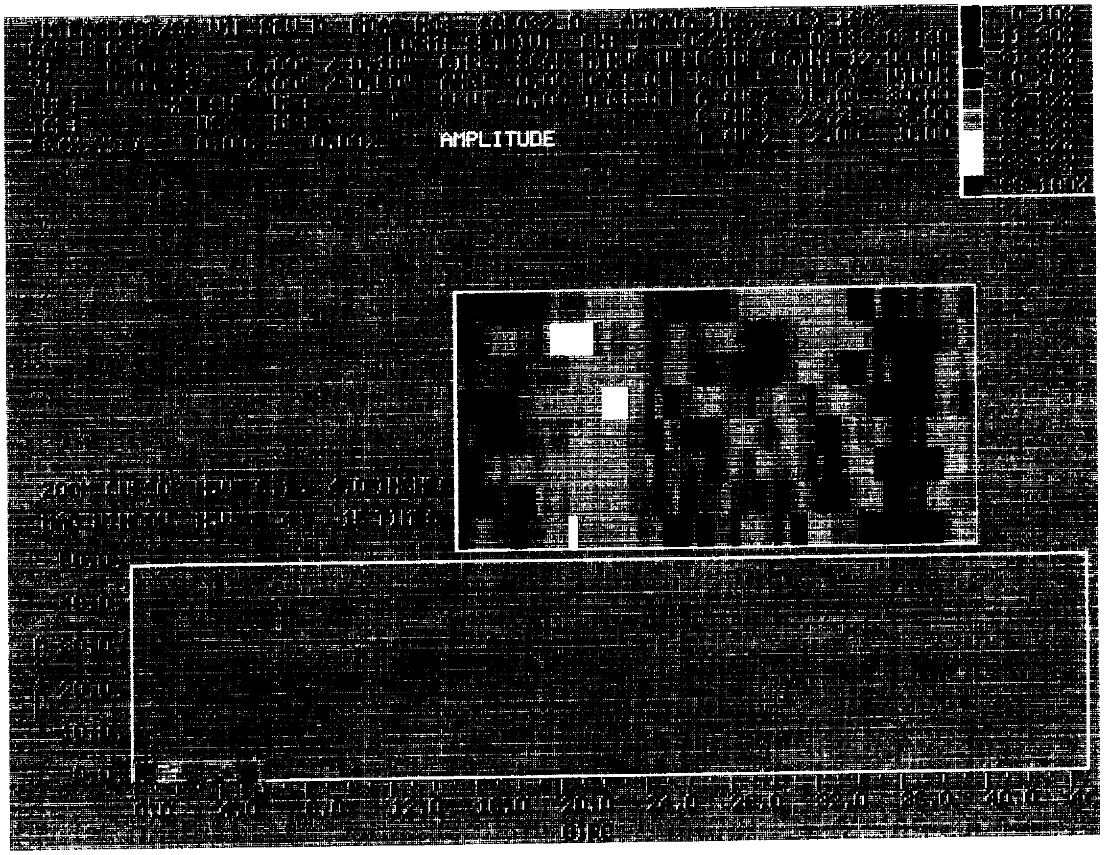
STEP 12.11



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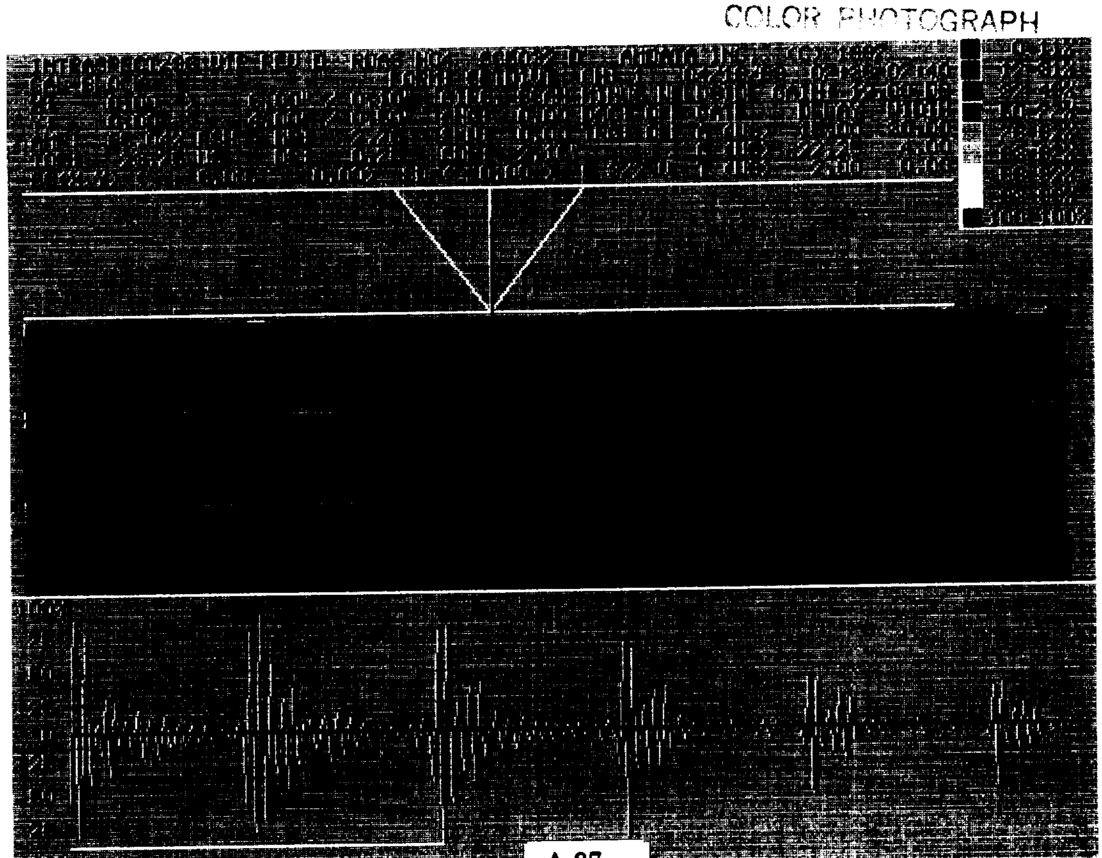

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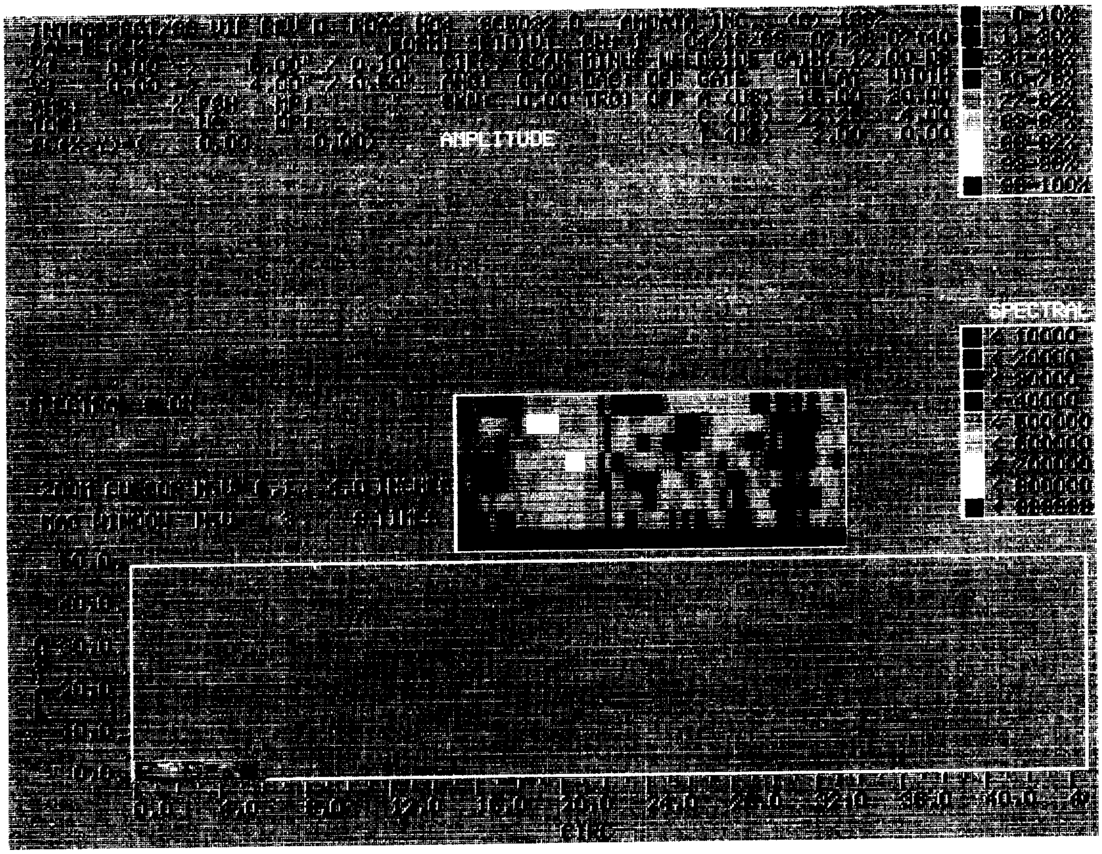

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Appendix B

RESULTS OF THE GENERIC URBIS COMPONENTS QUALIFICATION TEST AT THIOKOL SPACE OPERATIONS

GENERIC SYSTEM QUALIFICATION
URBIS COMPONENT ASSIGNMENT

LOCATION:<u>**M337A**</u>

ITEM	**P/N**
FLOPPY DRIVE	S-A51866
MONITOR	S-A51866-1
HARD DRIVE	S-A51866-2
TOPAZ	S-A51866-3
SCAN CONTROLLER	S-A51865-5
RDAS	S-A51866-5
RPP	S-A51866-6

```
****************************WARNING*********************************
* INTERCHANGING OF THESE COMPONENTS WITH OTHER URBIS COMPONENTS *
* DURING THIS SYSTEM'S QUALIFICATION TESTING WILL INVALID THE   *
* TEST.  IF EXCHANGING OF COMPONENTS IS NECESSARY, CONTACT       *
* EXTENSION 8992 TO OBTAIN CONCURRENCE.                          *
*******************************************************************
```

GENERIC SYSTEM QUALIFICATION
URBIS COMPONENT ASSIGNMENT

LOCATION: M111 ANNEX

ITEM	P/N
FLOPPY DRIVE	S-A51868
MONITOR	S-A51868-1
HARD DRIVE	S-A51868-2
TOPAZ	S-A51868-9
SCAN CONTROLLER	S-A51868-3
RDAS	S-A51868-4
RPP	S-A51868-5

***************************WARNING********************************
* INTERCHANGING OF THESE COMPONENTS WITH OTHER URBIS COMPONENTS *
* DURING THIS SYSTEM'S QUALIFICATION TESTING WILL INVALID THE *
* TEST. IF EXCHANGING OF COMPONENTS IS NECESSARY, CONTACT *
* EXTENSION 8992 TO OBTAIN CONCURRENCE. *
****

GENERIC SYSTEM QUALIFICATION
URBIS COMPONENT ASSIGNMENT

LOCATION: FINAL ASSEMBLY (SOUTH)

ITEM	P/N
FLOPPY DRIVE	S-A51865
MONITOR	S-A51865-1
HARD DRIVE	S-A51865-2
TOPAZ	S-A51865-3
SCAN CONTROLLER	S-A51866-4
RDAS	S-A51865-5
RPP	S-A51865-6

```
****************************WARNING*********************************
* INTERCHANGING OF THESE COMPONENTS WITH OTHER URBIS COMPONENTS *
* DURING THIS SYSTEM'S QUALIFICATION TESTING WILL INVALID THE     *
* TEST.  IF EXCHANGING OF COMPONENTS IS NECESSARY, CONTACT        *
* EXTENSION 8992 TO OBTAIN CONCURRENCE.                            *
********************************************************************
```

GENERIC SYSTEM QUALIFICATION
URBIS COMPONENT ASSIGNMENT

LOCATION: FINAL ASSEMBLY (NORTH)

ITEM	P/N
FLOPPY DRIVE	S-A51869
MONITOR	S-A51869-1
HARD DRIVE	S-A51867-3
TOPAZ	S-A51869-3
SCAN CONTROLLER	S-A51869-4
RDAS	S-A51869-5
RPP	S-A51869-6

*************************WARNING******************************
* INTERCHANGING OF THESE COMPONENTS WITH OTHER URBIS COMPONENTS *
* DURING THIS SYSTEM'S QUALIFICATION TESTING WILL INVALID THE *
* TEST. IF EXCHANGING OF COMPONENTS IS NECESSARY, CONTACT *
* EXTENSION 8992 TO OBTAIN CONCURRENCE. *
****

SYSTEM DIAGNOSTIC TEST

DATE: Feb. 17, 1989

OPERATOR: [illegible signature]

VERIFIED BY: [illegible signature]

SYSTEM SERIAL NUMBER: S-A51866

DELIVERY DATE: January, 1987

SOFTWARE VERSION NUMBER: 4.0

1) DID SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SYSTEM VALIDATION TEST SEQUENCE, OTHERWISE PROCEED TO STEP 2 OF THIS FORM.

2) WHICH DIAGNOSTIC TEST(S) FAILED? LIST IN SPACE BELOW.

FAILED DIAGNOSTIC TEST(S) __________

3) WERE ALL CONNECTIONS CHECKED TO VERIFY PROPER HOOK UP?

CIRCLE ONE: YES NO

IF NO, CHECK CONNECTIONS.

4) DID THE SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY UPON REBOOTING THE SYSTEM?

CIRCLE ONE: YES NO

IF YES, NOTE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO SYSTEM VALIDATION TEST.

CORRECTIVE ACTION(S) __________

SYSTEM DIAGNOSTIC TEST

(4 CONT.) IF NO, NOTE IN THE SPACE BELOW WHICH DIAGNOSTIC TEST(S) FAILED.

FAILED DIAGNOSTIC TEST(S) ______________________________

5) DID INDIVIDUAL SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

IF NO, NOTE IN THE SPACE BELOW WHICH SYSTEM DIAGNOSTIC TEST(S) FAILED.

FAILED SYSTEM DIAGNOSTIC TEST(S) ______________________

COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

PAGE 1
FORM A

SYSTEM DIAGNOSTIC TEST

DATE: [illegible]

OPERATOR: [illegible]

VERIFIED BY: [illegible]

SYSTEM SERIAL NUMBER: [illegible]

DELIVERY DATE: 1/87

SOFTWARE VERSION NUMBER: [illegible]

1) DID SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SYSTEM VALIDATION TEST SEQUENCE, OTHERWISE PROCEED TO STEP 2 OF THIS FORM.

2) WHICH DIAGNOSTIC TEST(S) FAILED? LIST IN SPACE BELOW.

FAILED DIAGNOSTIC TEST(S) ______

3) WERE ALL CONNECTIONS CHECKED TO VERIFY PROPER HOOK UP?

CIRCLE ONE: YES NO

IF NO, CHECK CONNECTIONS.

4) DID THE SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY UPON REBOOTING THE SYSTEM?

CIRCLE ONE: YES NO

IF YES, NOTE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO SYSTEM VALIDATION TEST.

CORRECTIVE ACTION(S) ______

SYSTEM DIAGNOSTIC TEST

(4 CONT.) IF NO, NOTE IN THE SPACE BELOW WHICH DIAGNOSTIC TEST(S) FAILED.

FAILED DIAGNOSTIC TEST(S) ______________________

5) DID INDIVIDUAL SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

IF NO, NOTE IN THE SPACE BELOW WHICH SYSTEM DIAGNOSTIC TEST(S) FAILED.

FAILED SYSTEM DIAGNOSTIC TEST(S) ______________________

COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

SYSTEM DIAGNOSTIC TEST

DATE: 5 March 89
OPERATOR: Brad Cushing
VERIFIED BY:

SYSTEM SERIAL NUMBER: 9A51865
DELIVERY DATE: Jan 87
SOFTWARE VERSION NUMBER: H C

1) DID SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SYSTEM VALIDATION TEST SEQUENCE, OTHERWISE PROCEED TO STEP 2 OF THIS FORM.

2) WHICH DIAGNOSTIC TEST(S) FAILED? LIST IN SPACE BELOW.

FAILED DIAGNOSTIC TEST(S) ____________________

3) WERE ALL CONNECTIONS CHECKED TO VERIFY PROPER HOOK UP?

CIRCLE ONE: YES NO

IF NO, CHECK CONNECTIONS.

4) DID THE SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY UPON REBOOTING THE SYSTEM?

CIRCLE ONE: YES NO

IF YES, NOTE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO SYSTEM VALIDATION TEST.

CORRECTIVE ACTION(S) ____________________

SYSTEM DIAGNOSTIC TEST

(4 CONT.) IF NO, NOTE IN THE SPACE BELOW WHICH DIAGNOSTIC TEST(S) FAILED.

FAILED DIAGNOSTIC TEST(S) ____________________

5) DID INDIVIDUAL SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

IF NO, NOTE IN THE SPACE BELOW WHICH SYSTEM DIAGNOSTIC TEST(S) FAILED.

FAILED SYSTEM DIAGNOSTIC TEST(S) ____________________

COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

SYSTEM DIAGNOSTIC TEST

DATE: 18 May 89

OPERATOR: B. Cushing

VERIFIED BY: Kamer 5/16/89

SYSTEM SERIAL NUMBER: 9A51869

DELIVERY DATE:

SOFTWARE VERSION NUMBER: 4.0

1) DID SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

   CIRCLE ONE: YES NO

   IF YES, PROCEED TO SYSTEM VALIDATION TEST SEQUENCE, OTHERWISE PROCEED TO STEP 2 OF THIS FORM.

2) WHICH DIAGNOSTIC TEST(S) FAILED? LIST IN SPACE BELOW.

   FAILED DIAGNOSTIC TEST(S) ________________

3) WERE ALL CONNECTIONS CHECKED TO VERIFY PROPER HOOK UP?

   CIRCLE ONE: YES NO

   IF NO, CHECK CONNECTIONS.

4) DID THE SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY UPON REBOOTING THE SYSTEM?

   CIRCLE ONE: YES NO

   IF YES, NOTE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO SYSTEM VALIDATION TEST.

   CORRECTIVE ACTION(S) ________________

SYSTEM DIAGNOSTIC TEST

(4 CONT.) IF NO, NOTE IN THE SPACE BELOW WHICH DIAGNOSTIC TEST(S) FAILED.

FAILED DIAGNOSTIC TEST(S) ______________________________

5) DID INDIVIDUAL SYSTEM DIAGNOSTIC TESTS PERFORM PROPERLY?

CIRCLE ONE: YES NO

IF YES, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

IF NO, NOTE IN THE SPACE BELOW WHICH SYSTEM DIAGNOSTIC TEST(S) FAILED.

FAILED SYSTEM DIAGNOSTIC TEST(S) ______________________________

COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

SYSTEM VALIDATION TEST

DATE: 2/14/89
OPERATOR: Brad Cushing
VERIFIED BY: [illegible signature]

SYSTEM SERIAL NUMBER: S-A51B66
CAL. BLOCK SERIAL NUMBER: URBIS 001 (membrane)
SOFTWARE VERSION NUMBER: 4.0

1) DID ALL SYSTEM VALIDATION TESTS STAY WITHIN THE SPECIFIED TOLERANCES SET FORTH IN AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 3.0?

   CIRCLE ONE: (YES NO

   IF YES, PROCEED TO BAND PASS FILTER VERIFICATION TEST.

   IF NO, LIST BELOW THE TEST(S) THAT DEVIATED OUTSIDE OF THE SPECIFIED TOLERANCES AND BY HOW MUCH.

   FAILED SYSTEM VALIDATION TEST(S) ____________________

2) WERE CONNECTIONS AND INSTRUCTIONS FOR PERFORMING THE SYSTEM VALIDATION TEST REVERIFIED?

   CIRCLE ONE: YES NO

   IF YES, PROCEED TO STEP 3 OF THIS FORM.

   IF NO, REVERIFY ALL INSTRUCTIONS AND CONNECTIONS UNIQUE TO THIS TEST.

SYSTEM VALIDATION TEST

3) UPON RE-PERFORMING THE SYSTEM VALIDATION TEST SEQUENCE, DID EACH INDIVIDUAL TEST STAY WITHIN TOLERANCE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO BAND PASS FILTER VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

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IF NO, NOTE IN THE SPACE BELOW WHICH TEST(S) FAILED AND BY HOW MUCH. ALSO, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

SYSTEM VALIDATION TEST

DATE: 20 Feb 89	SYSTEM SERIAL NUMBER: SA51363
OPERATOR: Brad Cushing	CAL. BLOCK SERIAL NUMBER: Membrane (URBIS 001)
VERIFIED BY: [illegible]	SOFTWARE VERSION NUMBER: 4C

1) DID ALL SYSTEM VALIDATION TESTS STAY WITHIN THE SPECIFIED TOLERANCES SET FORTH IN AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 3.0?

CIRCLE ONE: YES NO

IF YES, PROCEED TO BAND PASS FILTER VERIFICATION TEST.

IF NO, LIST BELOW THE TEST(S) THAT DEVIATED OUTSIDE OF THE SPECIFIED TOLERANCES AND BY HOW MUCH.

FAILED SYSTEM VALIDATION TEST(S) ______________________

2) WERE CONNECTIONS AND INSTRUCTIONS FOR PERFORMING THE SYSTEM VALIDATION TEST REVERIFIED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 3 OF THIS FORM.

IF NO, REVERIFY ALL INSTRUCTIONS AND CONNECTIONS UNIQUE TO THIS TEST.

SYSTEM VALIDATION TEST

3) UPON RE-PERFORMING THE SYSTEM VALIDATION TEST SEQUENCE, DID EACH INDIVIDUAL TEST STAY WITHIN TOLERANCE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO BAND PASS FILTER VERIFICATION TEST.

CORRECTIVE ACTION(S) ____

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IF NO, NOTE IN THE SPACE BELOW WHICH TEST(S) FAILED AND BY HOW MUCH. ALSO, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

SYSTEM VALIDATION TEST

DATE: 8 March 89

OPERATOR: Brad [illegible]

VERIFIED BY: [illegible]

SYSTEM SERIAL NUMBER: CAS1565

CAL. BLOCK SERIAL NUMBER: membrane (URBIS 001)

SOFTWARE VERSION NUMBER: 4 C

1) DID ALL SYSTEM VALIDATION TESTS STAY WITHIN THE SPECIFIED TOLERANCES SET FORTH IN AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 3.0?

CIRCLE ONE: YES NO

IF YES, PROCEED TO BAND PASS FILTER VERIFICATION TEST.

IF NO, LIST BELOW THE TEST(S) THAT DEVIATED OUTSIDE OF THE SPECIFIED TOLERANCES AND BY HOW MUCH.

FAILED SYSTEM VALIDATION TEST(S) ______________________

2) WERE CONNECTIONS AND INSTRUCTIONS FOR PERFORMING THE SYSTEM VALIDATION TEST REVERIFIED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 3 OF THIS FORM.

IF NO, REVERIFY ALL INSTRUCTIONS AND CONNECTIONS UNIQUE TO THIS TEST.

SYSTEM VALIDATION TEST

3) UPON RE-PERFORMING THE SYSTEM VALIDATION TEST SEQUENCE, DID EACH INDIVIDUAL TEST STAY WITHIN TOLERANCE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO BAND PASS FILTER VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

IF NO, NOTE IN THE SPACE BELOW WHICH TEST(S) FAILED AND BY HOW MUCH. ALSO, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

SYSTEM VALIDATION TEST

DATE: 18 May 89

OPERATOR: B Cushing

VERIFIED BY: [illegible] Kumer 5/18/89

SYSTEM SERIAL NUMBER: SA-51869

CAL. BLOCK SERIAL NUMBER: ~~N/A~~ Membrane (URBIS001)

SOFTWARE VERSION NUMBER: 4.C

1) DID ALL SYSTEM VALIDATION TESTS STAY WITHIN THE SPECIFIED TOLERANCES SET FORTH IN AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 3.0?

CIRCLE ONE: YES NO

IF YES, PROCEED TO BAND PASS FILTER VERIFICATION TEST.

IF NO, LIST BELOW THE TEST(S) THAT DEVIATED OUTSIDE OF THE SPECIFIED TOLERANCES AND BY HOW MUCH.

FAILED SYSTEM VALIDATION TEST(S) ______________________

2) WERE CONNECTIONS AND INSTRUCTIONS FOR PERFORMING THE SYSTEM VALIDATION TEST REVERIFIED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 3 OF THIS FORM.

IF NO, REVERIFY ALL INSTRUCTIONS AND CONNECTIONS UNIQUE TO THIS TEST.

SYSTEM VALIDATION TEST

3) UPON RE-PERFORMING THE SYSTEM VALIDATION TEST SEQUENCE, DID EACH INDIVIDUAL TEST STAY WITHIN TOLERANCE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, THEN PROCEED TO BAND PASS FILTER VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

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IF NO, NOTE IN THE SPACE BELOW WHICH TEST(S) FAILED AND BY HOW MUCH. ALSO, COMPLETE A FAILURE/PROBLEM REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO DESCRIBE THE SPECIFIC PROBLEM(S).

BAND PASS FILTER VERIFICATION TEST

DATE: 7-11-89

OPERATOR: [illegible]

VERIFIED BY: [illegible]

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: S-A51866

OSCILLOSCOPE SERIAL NUMBER: U-B003401

WAVE FORM GENERATOR SERIAL NUMBER: U-B03348

1) COMPLETE THE FOLLOWING CHECK LIST: — COMPLETED (INITIALS)

   a) Connect the Marconi Instruments, 2022C Wave Form Generator to the Remote Pulser Preamplifier (RPP). .... [initialed]

   b) Intraspect 9836 APS is in A-scope mode. ... [initialed]

   c) A continuous wave pulse is being sent into the RPP. .... [initialed]

   d) A signal response is being obtained of the A-scope. .... [initialed]

   e) Gain is set to 17.0 dB. .... [initialed]

   f) Record frequency versus amplitude when incrementing the frequency up (page 3, 4, & 5 of this form). .... [initialed]

2) Did the band pass filters perform properly?

   Circle one: Yes No

   If yes, proceed to A/D convertor verification test.

   If no, verify that all connections unique to this verification test are properly hooked up, and note in the space provided below, which filter(s) failed.

   Failed Band Pass Filter(s) ____________________

3) Upon re-performing this test, did the band pass filters perform properly?

Circle one: Yes No

If yes, note in the space below, what was done to correct the problem.

Corrective Action(s) ______________________________________
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If no, complete a Problem/Failure Report, Form N, and notify MTI Electronic Maintenance.

***NOTE: Be prepared to describe the specific problem(s).

ORIGINAL PAGE IS
OF POOR QUALITY

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
0.5 MHz HIGH PASS FILTER

FREQUENCY		AMPLITUDE RESPONSE
250.00 kHz	1.6	0%
300.00 kHz	.6	0%
350.00 khz	5.5	2.3%
400.00 kHz	13.3	13.3%
450.00 kHz	27.3	10.9%
500.00 kHz	52.3	40.6%
550.00 kHz	75.0	61.2%
600.00 kHz	88.8	9.1%
650.00 kHz	89.2	81.3%
700.00 kHz	89.2	60.9%
750.00 kHz	89.9	42.2%
850.00 kHz	88.3	28.1%
950.00 kHz	87.1	78.1%
1.00 MHz	87.8	13.3%

ORIGINAL PAGE IS
OF POOR QUALITY

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
4.0 MHz LOW PASS FILTER

FREQUENCY		AMPLITUDE RESPONSE	
1.00 MHz	90.6	11.7%	89.1%
1.50 MHz	89.8	52.3% ~~11.7%~~	90.6%
2.00 MHz	88.3	89.1% ~~11.7%~~	89.1%
2.50 MHz	84.4	75.8%	85.2%
3.00 MHz	78.9	30.5%	80.5%
3.50 MHz	71.9	25.2%	77.3%
4.00 MHz	53.9	47.7%	73.9%
4.50 MHz	7.0	7.0%	69.5%
5.00 MHz	1.6	1.6%	66.9%
5.50 MHz	1.6	1.6%	60.9%
6.00 MHz	1.6	1.4%	53.1%
6.50 MHz	1.6	1.6%	43.0%
7.00 MHz	1.6	1.6%	28.9%

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
8.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
5.00 MHz	65.6
5.50 MHz	60.9
6.00 MHz	53.9
6.50 MHz	46.2
7.00 MHz	28.9
7.50 MHz	13.3
8.00 MHz	10.9
8.50 MHz	5.6
9.00 MHz	3.9
9.50 MHz	2.3
10.00 MHz	1.6
10.50 MHz	1.6
11.00 MHz	1.6

BAND PASS FILTER VERIFICATION TEST

DATE: 21 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: J. Kamer.

SOFTWARE VERSION NUMBER: 4.C

SYSTEM SERIAL NUMBER: SA 51868

OSCILLOSCOPE SERIAL NUMBER: U-B003401

WAVE FORM GENERATOR SERIAL NUMBER: U-B03348

1) COMPLETE THE FOLLOWING CHECK LIST: — COMPLETED (INITIALS)

a) Connect the Marconi Instruments, 2022C Wave Form Generator to the Remote Pulser Preamplifier (RPP). .... Q.K.

b) Intraspect 9836 APS is in A-scope mode. ... BSC

c) A continuous wave pulse is being sent into the RPP. .... BSC

d) A signal response is being obtained of the A-scope. .... Q.K.

e) Gain is set to 17.0 dB. .... Q.K.

f) Record frequency versus amplitude when incrementing the frequency up (page 3, 4, & 5 of this form). .... Q.K.

2) Did the band pass filters perform properly?

Circle one: Yes No

If yes, proceed to A/D convertor verification test.

If no, verify that all connections unique to this verification test are properly hooked up, and note in the space provided below, which filter(s) failed.

Failed Band Pass Filter(s) ______________________________

3) Upon re-performing this test, did the band pass filters perform properly?

Circle one: Yes No

If yes, note in the space below, what was done to correct the problem.

Corrective Action(s) ______________________________

If no, complete a Problem/Failure Report, Form N, and notify MTI Electronic Maintenance.

***NOTE: Be prepared to describe the specific problem(s).

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
0.5 MHz HIGH PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
250.00 kHz	0
300.00 kHz	0
350.00 khz	0
400.00 kHz	3.9
450.00 kHz	7.8
500.00 kHz	~~7.8~~ 14.1
550.00 kHz	18.8
600.00 kHz	19.5
650.00 kHz	20.3
700.00 kHz	21.1
750.00 kHz	21.1
850.00 kHz	21.9
950.00 kHz	21.9
1.00 MHz	21.9

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
4.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
1.00 MHz	21.9
1.50 MHz	21.9
2.00 MHz	22.7
2.50 MHz	21.1
3.00 MHz	19.5
3.50 MHz	18.0
4.00 MHz	13.3
4.50 MHz	2.3
5.00 MHz	0
5.50 MHz	0
6.00 MHz	0
6.50 MHz	0
7.00 MHz	0

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
8.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
5.00 MHz	90.5
5.50 MHz	82.0
6.00 MHz	73.4
6.50 MHz	60.9
7.00 MHz	45.3
7.50 MHz	25.0
8.00 MHz	7.8
8.50 MHz	10.2
9.00 MHz	6.3
9.50 MHz	3.1
10.00 MHz	2.3
10.50 MHz	1.6
11.00 MHz	0

BAND PASS FILTER VERIFICATION TEST

DATE: 10 March 89

OPERATOR: Brad Cushing

VERIFIED BY: [illegible]

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51865

OSCILLOSCOPE SERIAL NUMBER: U-B003401

WAVE FORM GENERATOR SERIAL NUMBER: U-B03348

1) COMPLETE THE FOLLOWING CHECK LIST:

	COMPLETED (INITIALS)
a) Connect the Marconi Instruments, 2022C Wave Form Generator to the Remote Pulser Preamplifier (RPP).	BSC
b) Intraspect 9836 APS is in A-scope mode. ...	BSC
c) A continuous wave pulse is being sent into the RPP.	BSC
d) A signal response is being obtained of the A-scope.	BSC
e) Gain is set to 17.0 dB.	BSC
f) Record frequency versus amplitude when incrementing the frequency up (page 3, 4, & 5 of this form).	BSC

2) Did the band pass filters perform properly?

Circle one: Yes No

If yes, proceed to A/D convertor verification test.

If no, verify that all connections unique to this verification test are properly hooked up, and note in the space provided below, which filter(s) failed.

Failed Band Pass Filter(s) ______________________

3) Upon re-performing this test, did the band pass filters perform properly?

Circle one: Yes No

If yes, note in the space below, what was done to correct the problem.

Corrective Action(s) ______________________________

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____
____
____
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If no, complete a Problem/Failure Report, Form N, and notify MTI Electronic Maintenance.

***NOTE: Be prepared to describe the specific problem(s).

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
0.5 MHz HIGH PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
250.00 kHz	0
300.00 kHz	2.3
350.00 khz	4.7
400.00 kHz	10.9
450.00 kHz	25.0
500.00 kHz	50.0
550.00 kHz	78.8
600.00 kHz	88.3
650.00 kHz	88.3
700.00 kHz	86.0
750.00 kHz	86.7
850.00 kHz	88.3
950.00 kHz	89.0
1.00 MHz	89.8

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
4.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
1.00 MHz	90.6
1.50 MHz	91.4
2.00 MHz	88.3
2.50 MHz	88.3
3.00 MHz	85.9
3.50 MHz	82.0
4.00 MHz	56.3
4.50 MHz	9.4
5.00 MHz	0
5.50 MHz	0
6.00 MHz	0
6.50 MHz	0
7.00 MHz	0

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
8.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
5.00 MHz	~~23.8~~ 75.0
5.50 MHz	75.0
6.00 MHz	71.9
6.50 MHz	70.3
7.00 MHz	68.0
7.50 MHz	60.2
8.00 MHz	50.8
8.50 MHz	18.8
9.00 MHz	5.5
9.50 MHz	0
10.00 MHz	0
10.50 MHz	0
11.00 MHz	0

BAND PASS FILTER VERIFICATION TEST

DATE: 26 May 89 ~~23 May 89~~

OPERATOR: B Kushing

VERIFIED BY: [illegible] 5-26-89

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA-51869

OSCILLOSCOPE SERIAL NUMBER: ~~SA-51869~~ U-B003401

WAVE FORM GENERATOR SERIAL NUMBER: U-B03348

1) COMPLETE THE FOLLOWING CHECK LIST:	COMPLETED (INITIALS)
a) Connect the Marconi Instruments, 2022C Wave Form Generator to the Remote Pulser Preamplifier (RPP).	BSC
b) Intraspect 9836 APS is in A-scope mode. ...	BSC
c) A continuous wave pulse is being sent into the RPP.	BSC
d) A signal response is being obtained of the A-scope.	BSC
e) Gain is set to 17.0 dB.	BSC
f) Record frequency versus amplitude when incrementing the frequency up (page 3, 4, & 5 of this form).	BSC

2) Did the band pass filters perform properly?

Circle one: Yes ~~No~~

If yes, proceed to A/D convertor verification test.

If no, verify that all connections unique to this verification test are properly hooked up, and note in the space provided below, which filter(s) failed.

Failed Band Pass Filter(s) ____________________

3) Upon re-performing this test, did the band pass filters perform properly?

Circle one: Yes No

If yes, note in the space below, what was done to correct the problem.

Corrective Action(s) ______________________________

If no, complete a Problem/Failure Report, Form N, and notify MTI Electronic Maintenance.

***NOTE: Be prepared to describe the specific problem(s).

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
0.5 MHz HIGH PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE	
250.00 kHz	0	0.0
300.00 kHz	0	0.0
350.00 khz	0	3.9
400.00 kHz	4.7	10.2
450.00 kHz	17.2	23.4
500.00 kHz	47	43.8
550.00 kHz	73.4	59.4
600.00 kHz	57.0	64.1
650.00 kHz	48.4	65.6
700.00 kHz	35.2	68.0
750.00 kHz	~~21.2~~ 100	68.8
850.00 kHz	46.0	70.3
950.00 kHz	46.0	72.7
1.00 MHz	97.0	74.2

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
4.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE		
1.00 MHz	~~84.0~~	~~95.0~~	74.2
1.50 MHz	~~40.0~~	~~67.0~~	74.2
2.00 MHz	~~25.0~~	~~25.0~~	74.2
2.50 MHz	~~67.0~~	~~67.0~~	71.9
3.00 MHz	~~66.0~~	~~100.0~~	71.1
3.50 MHz	~~100.0~~	~~100.0~~	68.0
4.00 MHz	~~100.0~~	~~85.0~~	51.0
4.50 MHz	~~100.0~~	~~10.4~~	7.0
5.00 MHz		~~1.6~~	0.0
5.50 MHz		~~0~~	0.0
6.00 MHz		~~0~~	0.0
6.50 MHz		~~0~~	0.0
7.00 MHz		~~0~~	0.0

BAND PASS FILTER VERIFICATION TEST
AMPLITUDE VERSUS FREQUENCY RESPONSE
8.0 MHz LOW PASS FILTER

FREQUENCY	AMPLITUDE RESPONSE
5.00 MHz	~~100.0~~ 69.0
5.50 MHz	~~100.0~~ 68.8
6.00 MHz	~~100.0~~ 68.0
6.50 MHz	~~100.0~~ 68.8
7.00 MHz	~~100.0~~ 68.0
7.50 MHz	~~100.0~~ 68.0
8.00 MHz	~~53.0~~ 57.8
8.50 MHz	~~28.0~~ 17.2
9.00 MHz	~~7.0~~ 5.5
9.50 MHz	~~3.0~~ 0.0
10.00 MHz	~~0~~ 0.0
10.50 MHz	~~0~~ 0.0
11.00 MHz	~~0~~ 0.0

A/D CONVERTER VERIFICATION TEST

DATE: 2/7/89

OPERATOR:

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: S-A51866

VERIFIED BY:

1) COMPLETE THE FOLLOWING CHECK LIST

	COMPLETED (INITIALS)
a) Set A/D converter sampling rate to 20 MHz.	
b) Set sampling increment to 0.10 in.	
c) Set Y-axis stepper motor velocity to maximum.	
d) Place system in data acquisition mode.	
e) A-scan gate delay at 9.0 microseconds	
f) A-scan gate width at 50.0 microseconds	
g) C-scan gate delay at 41.0 microseconds	
h) C-scan gate width at 15.0 microseconds	

2) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

If yes, make a hard copy of the screen presentation, attach it to this form, and proceed to the transducer verification tests.

If no, make a hard copy presentation of the screen display, re-verify above check lists, and re-perform scan.

3) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

If yes, note in the space below what was done to correct the problem, and proceed to the Transducer Verification Tests.

If no, make a hard copy presentation of the screen, and begin incrementing upward using the system default values, until a properly digitized signal is obtained. Proceed to step 4.

CORRECTIVE ACTION(S) ______________________________

4) If a properly digitized wave form is not obtained with any of the system default values, complete a Failure/Problem Report, FORM N, and notify MTI Electronic Maintenance.

***NOTE: Be prepared to describe specific problem(s).

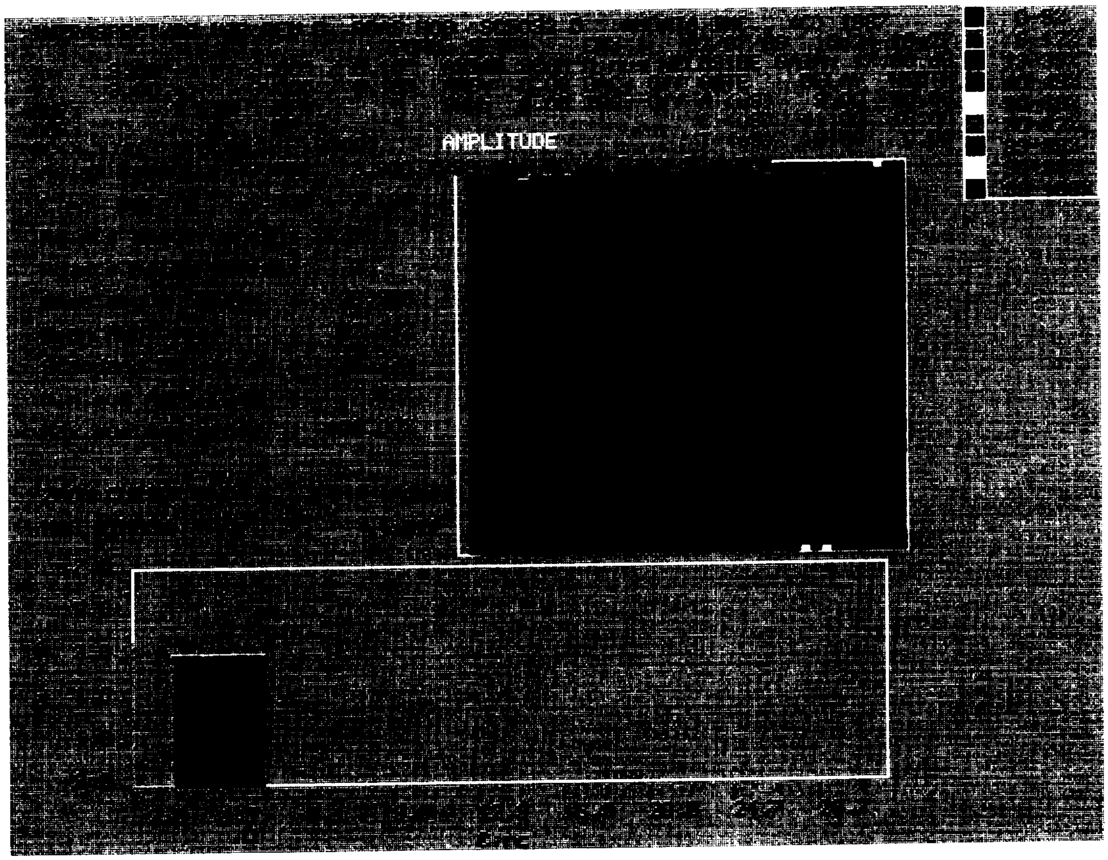
5) Note in the space below, what sampling rate provided an acceptable digitized wave (both A and C scan form). Attach hard copy of the screen presentation to this form.

ACCEPTABLE SAMPLING RATE: 20 MHz @ 2.0"/sec.

6) ATTACH HARD COPY HERE

2/7/89

A/D Converter Verification Test
Form D



Sampling Rate: 20 MHz
Y-Axis Scan Speed: 2.0"/sec.

ORIGINAL PAGE
COLOR PHOTOGRAPH

A/D CONVERTER VERIFICATION TEST

DATE: 21 Feb 89

OPERATOR: Brad Cushing

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51868

VERIFIED BY: [illegible signature]

1) COMPLETE THE FOLLOWING CHECK LIST — COMPLETED (INITIALS)

a)	Set A/D converter sampling rate to 20 MHz.	BSC
b)	Set sampling increment to 0.10 in.	BSC
c)	Set Y-axis stepper motor velocity to maximum.	BSC
d)	Place system in data acquisition mode.	BSC
e)	A-scan gate delay at 9.0 microseconds	BSC
f)	A-scan gate width at 50.0 microseconds	BSC
g)	C-scan gate delay at ~~41.0~~ 40.35 microseconds	BSC
h)	C-scan gate width at 15.0 microseconds	BSC

2) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

If yes, make a hard copy of the screen presentation, attach it to this form, and proceed to the transducer verification tests.

If no, make a hard copy presentation of the screen display, re-verify above check lists, and re-perform scan.

3) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

PRECEDING PAGE BLANK NOT FILMED

If yes, note in the space below what was done to correct the problem, and proceed to the Transducer Verification Tests.

If no, make a hard copy presentation of the screen, and begin incrementing upward using the system default values, until a properly digitized signal is obtained. Proceed to step 4.

CORRECTIVE ACTION(S) ______________________________________
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4) If a properly digitized wave form is not obtained with any of the system default values, complete a Failure/Problem Report, FORM N, and notify MTI Electronic Maintenance.

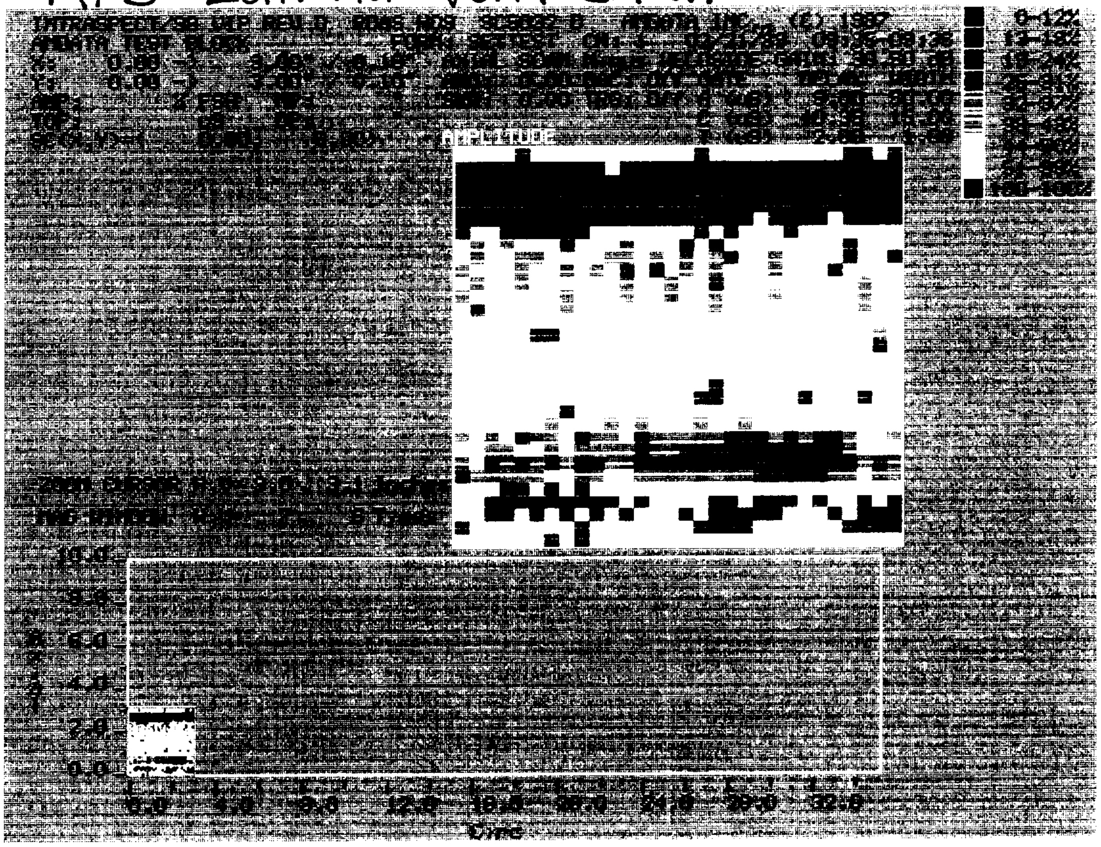
***NOTE: Be prepared to describe specific problem(s).

5) Note in the space below, what sampling rate provided an acceptable digitized wave (both A and C scan form). Attach hard copy of the screen presentation to this form.

ACCEPTABLE SAMPLING RATE:____________________

6) ATTACH HARD COPY HERE
- -

A/D Converter Verification



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A/D CONVERTER VERIFICATION TEST

DATE: 8 March 89

OPERATOR: Brad Cushing

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51865

VERIFIED BY:

1) COMPLETE THE FOLLOWING CHECK LIST	COMPLETED (INITIALS)
a) Set A/D converter sampling rate to 20 MHz.	BSC
b) Set sampling increment to 0.10 in.	BSC
c) Set Y-axis stepper motor velocity to maximum.	BSC
d) Place system in data acquisition mode.	BSC
e) A-scan gate delay at 9.0 microseconds	BSC
f) A-scan gate width at 50.0 microseconds	BSC
g) C-scan gate delay at ~~41.0~~ ~~26.0~~ 41.0 microseconds	BSC
h) C-scan gate width at 15.0 microseconds	BSC

2) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

If yes, make a hard copy of the screen presentation, attach it to this form, and proceed to the transducer verification tests.

If no, make a hard copy presentation of the screen display, re-verify above check lists, and re-perform scan.

3) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

If yes, note in the space below what was done to correct the problem, and proceed to the Transducer Verification Tests.

If no, make a hard copy presentation of the screen, and begin incrementing upward using the system default values, until a properly digitized signal is obtained. Proceed to step 4.

CORRECTIVE ACTION(S) ______________________________

4) If a properly digitized wave form is not obtained with any of the system default values, complete a Failure/Problem Report, FORM N, and notify MTI Electronic Maintenance.

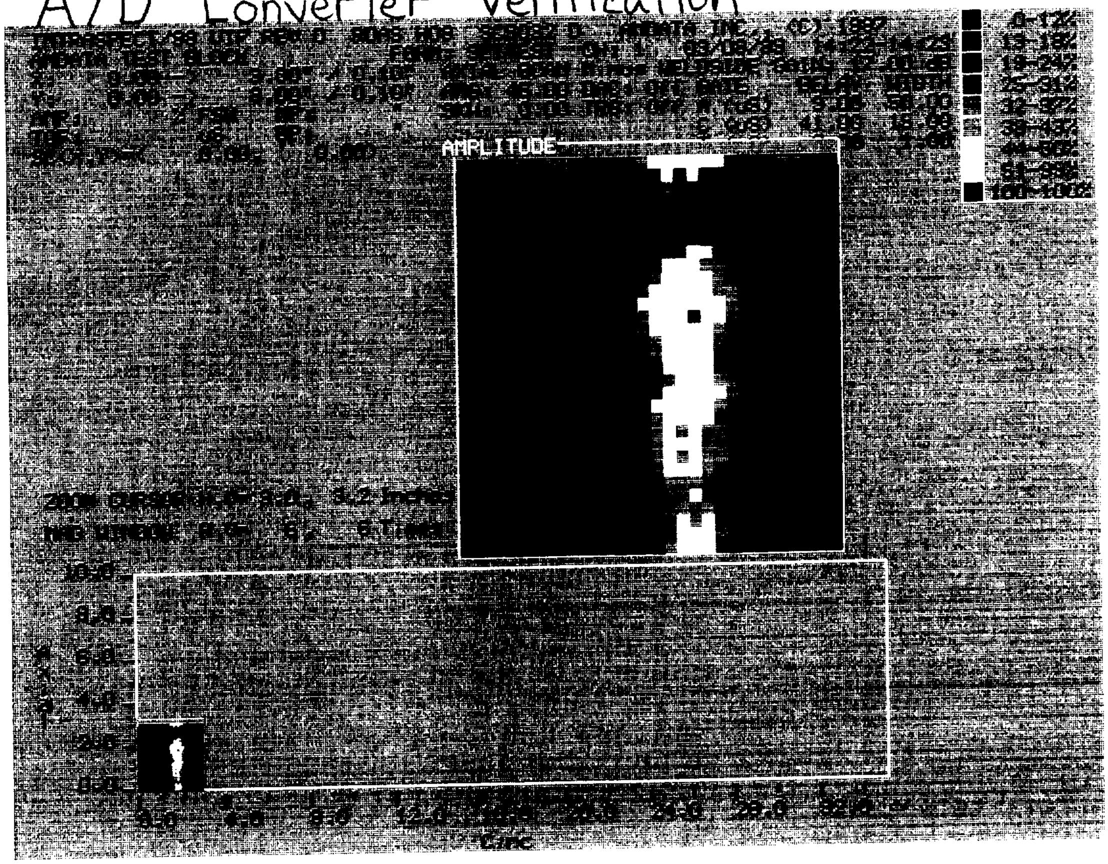
***NOTE: Be prepared to describe specific problem(s).

5) Note in the space below, what sampling rate provided an acceptable digitized wave (both A and C scan form). Attach hard copy of the screen presentation to this form.

ACCEPTABLE SAMPLING RATE: ____________________

6) ATTACH HARD COPY HERE

A/D Converter Verification



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A/D CONVERTER VERIFICATION TEST

DATE: 15 May 99

OPERATOR: B. Cushing

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51569

VERIFIED BY: J. Purner 5/16/99

1) COMPLETE THE FOLLOWING CHECK LIST

	COMPLETED (INITIALS)
a) Set A/D converter sampling rate to 20 MHz.	BSC
b) Set sampling increment to 0.10 in.	BSC
c) Set Y-axis stepper motor velocity to maximum.	BSC
d) Place system in data acquisition mode.	BSC
e) A-scan gate delay at ~~9.0~~ 40.0 microseconds	BSC
f) A-scan gate width at ~~50.0~~ 26.0 microseconds	BSC
g) C-scan gate delay at ~~41.0~~ 48.0 microseconds	BSC
h) C-scan gate width at ~~15.0~~ 4.5 microseconds	BSC

2) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

If yes, make a hard copy of the screen presentation, attach it to this form, and proceed to the transducer verification tests.

If no, make a hard copy presentation of the screen display, re-verify above check lists, and re-perform scan.

3) Has the C-scan presentation been accurately displayed?

Circle one: Yes No

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If yes, note in the space below what was done to correct the problem, and proceed to the Transducer Verification Tests.

If no, make a hard copy presentation of the screen, and begin incrementing upward using the system default values, until a properly digitized signal is obtained. Proceed to step 4.

CORRECTIVE ACTION(S) ______________________________________

4) If a properly digitized wave form is not obtained with any of the system default values, complete a Failure/Problem Report, FORM N, and notify MTI Electronic Maintenance.

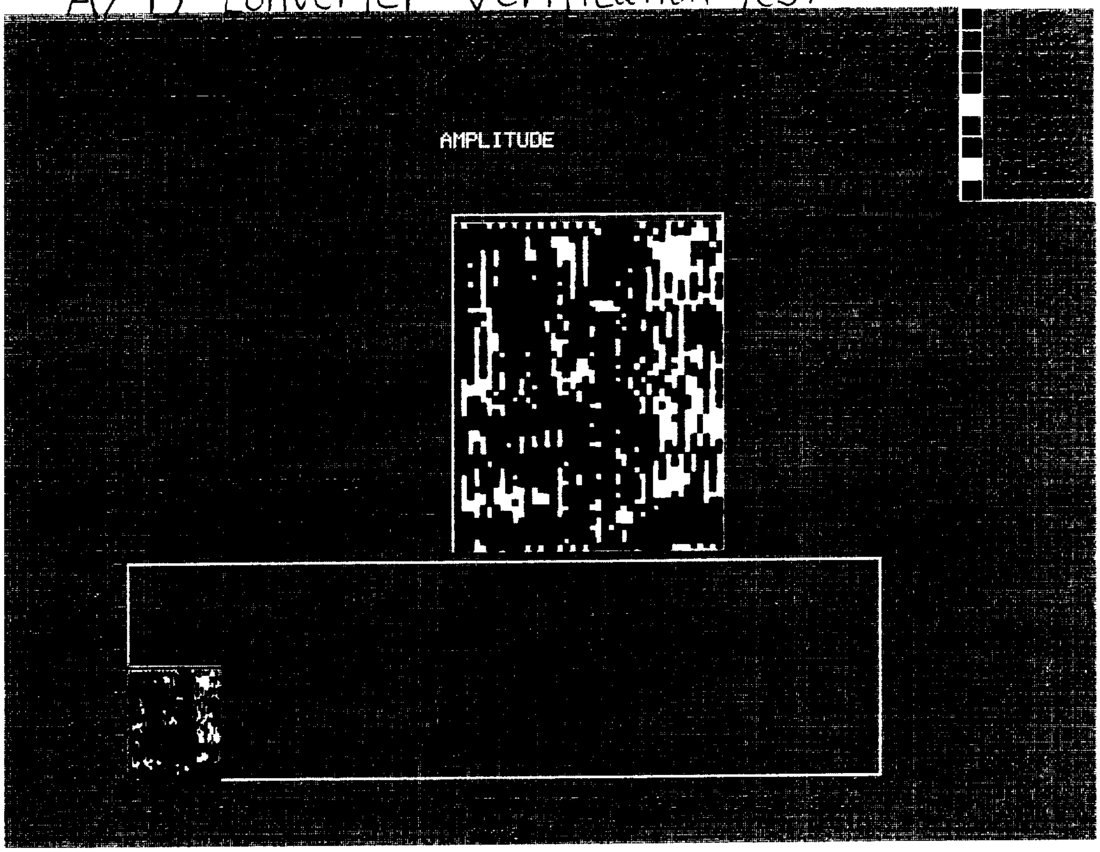
***NOTE: Be prepared to describe specific problem(s).

5) Note in the space below, what sampling rate provided an acceptable digitized wave (both A and C scan form). Attach hard copy of the screen presentation to this form.

ACCEPTABLE SAMPLING RATE:____________________

6) ATTACH HARD COPY HERE

A/D converter verification test



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TRANSDUCER VERIFICATION TESTS

DATE: 2/15/89

OPERATOR: Brad Cushing

VERIFIED BY: J. Kaner

SYSTEM SERIAL NUMBER: S-A51866

TRANSDUCER SERIAL NUMBER: T8358

SOFTWARE VERSION NUMBER: 4.0

1) Does the vendor's Transducer Characteristic Analysis Sheet contain the following:

	Item	Check if Listed
a)	Customer name	√
b)	Vendor performing the test	√
c)	Date performed	√
d)	Analyst performing the test	√
e)	Target material	NC
f)	Water travel distance	NC
g)	Peak frequency	√
h)	Band width center frequency	√
i)	Band width at -6 dB	NC
j)	Sensitivity (Loop Gain)	√
k)	Photograph of oscilloscope	
	O Frequency spectrum	NC
	O RF envelope	NC
l)	Pulser/receiver used	√
m)	Oscilloscope used	√
n)	Spectrum analyzer used	√
o)	Excitation voltage used	√
p)	Attenuation used	√
q)	Vertical scale description (dB and volts)	NC
r)	Horizontal scale description (frequency and time)	√
s)	Gain used	√
t)	Band width used	√
u)	Transducer type	√
v)	Transducer serial number	√
w)	Active area	√
x)	Type and length of cable used	NC
y)	Water couplant temperature	NC
z)	Sampling rate	√

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2) Was there any damage seen to the transducer while performing the visual examination?

Circle one: Yes No

If no, proceed to step 3 of this form.

If yes, note in the space below what type of damage was seen. Send transducer back to vendor.

Observed Damage to Transducer ______________________

3) Complete the Following Check List

	Completed (Initials)
a) 3 in. x 3 in. x 1 in. glass block on bottom of ~~immersion tank~~ aluminum block	BC
b) At least six inches of water is covering the glass block target	BC
c) Transducer is connected to Z-axis arm of immersion tank	BC
d) Transmitting face of transducer is parallel to target material	BC
e) Transducer is connected to the URBIS	BC
f) Transducer face is 4 inches above the target material	BC
g) Inspection system is in A-scope mode	BC

4) Verify if water temperature is between 68° and 82° Fahrenheit. Note measured temperature below.

Measured Temperature: 78°F

5) Pulse the system and adjust the gain so the first complete back-wall reflection is at 80 percent full screen height. Note the gain needed.

Gain Reading: ~~10.0 dB~~ 8.0 dB

6) Does in house transducer characteristic analysis match vendor analysis?

Circle one: Yes No

If yes, attach the hard copy presentation of the analysis to this form and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

If no, note in the space below what conditions were rejectable.

Rejectable Conditions The rejectable condition does not reside with the I-98 transducer analysis software, but do to how quality fabrication of the transducer itself.

7) Did the in house transducer characteristic analysis match the vendor's sheet on the retry?

Circle one: Yes No

If yes, note in the space below what was done to correct the problem, and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

Actions Taken to Correct Problem ______________________

If no, complete a Problem/Failure Report, FORM N. Notify the vendor, send the transducer, copy of the Problem/Failure Report, and a copy of the in house analysis back to the vendor.

2/19/89

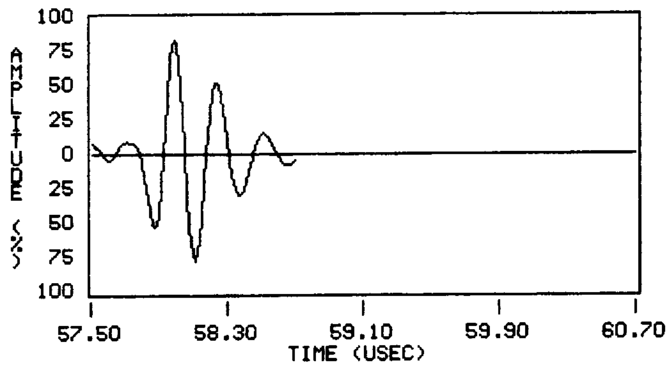
TRANSDUCER ANALYSIS Test

TRANSDUCER ANALYSIS

2-15-89 13:17:24

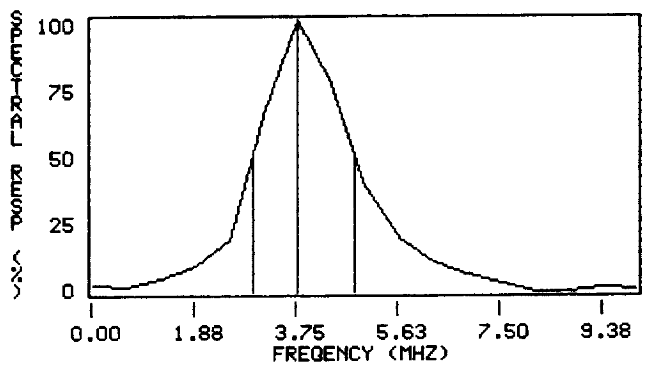
GENERAL INFORMATION

FORM NAME	SETPWR1
SAMPLING RATE	80.00 MHZ
MANUFACTURER	C. E.
MODEL	TS-196
SERIAL NUMBER	T8358



CALCULATED FEATURES

PEAK MAG.	2145.61
PEAK FREQ.	3.75 MHZ
LOWER 6dB FREQ.	2.93 MHZ
UPPER 6dB FREQ.	4.80 MHZ
BAND CENTER FREQ.	3.87 MHZ
BANDWIDTH	48.48 %



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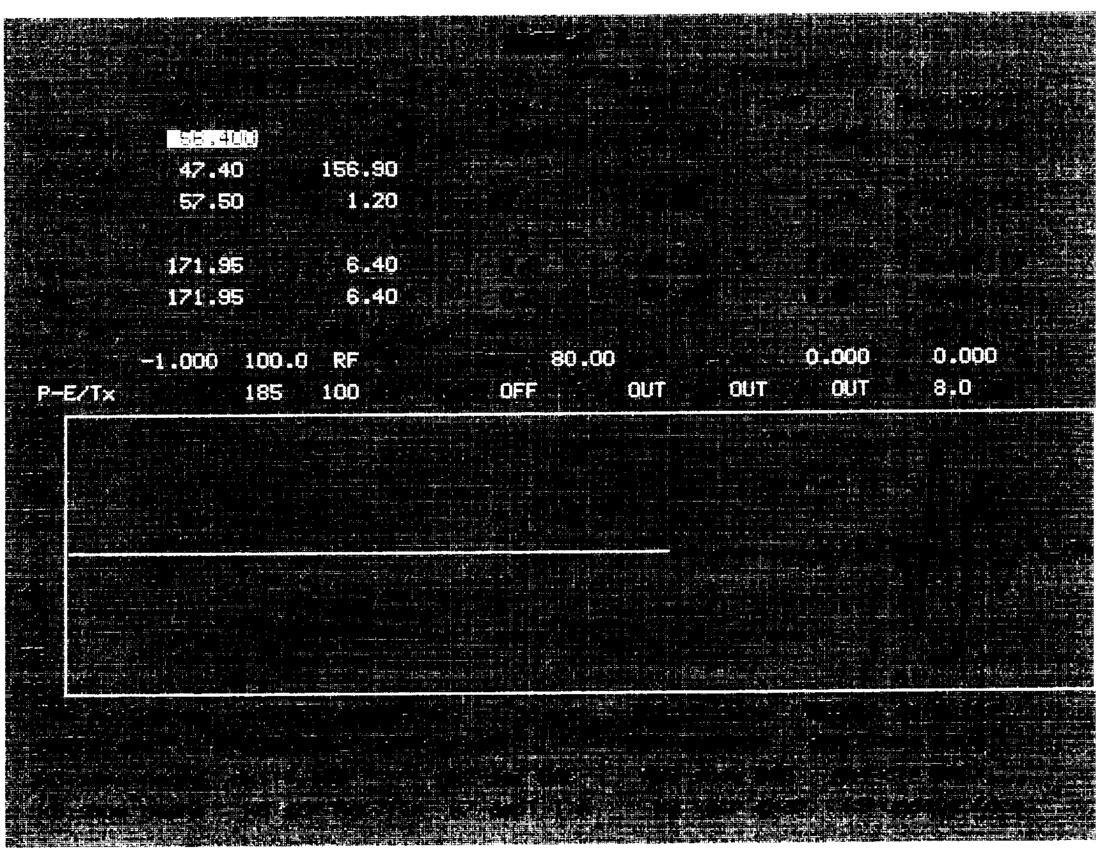

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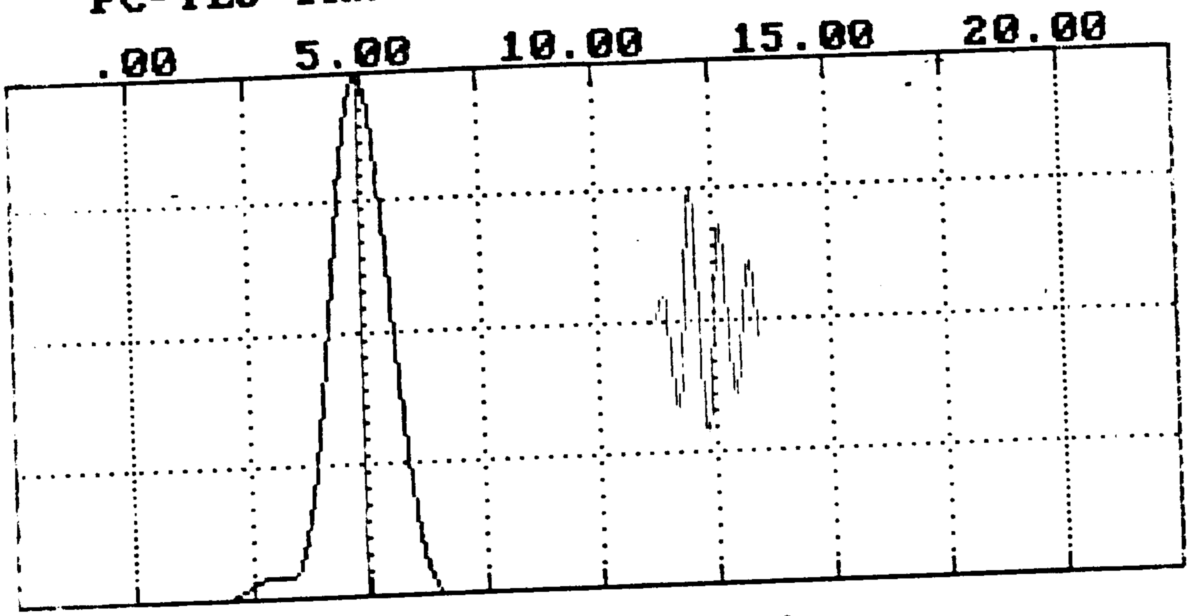
PC-TES TRANSDUCER EVALUATION REPORT



--- power spectrum (Mhz)
time waveform

MORTHOL

Test Date: JUL 1, 1987 (14:30:28)

Report Date: JUL 1, 1987 (14:32:47)

Model : 5052PR
Serial # : PR 897

PULSER/RECEIVER PARAMETERS
Energy : 1
Gain (dB) : 40
Atten.(dB): 40

Damping : 0
HF Filt.: OUT
BF Filt.: N/A

Model : TS-196
Serial # : T8358

TRANSDUCER PARAMETERS
Diameter : .750
Center Freq. : 5.0 MHZ

Shoe Type : N/A
Couplant : WATER

DATA COLLECTION PARAMETERS
Sample Rate (Mhz) : 40.000
Gate length (usec) : .800

FEATURES

Power Spectrum
Low 3dB (Mhz): 4.141
High 3dB(Mhz): 5.703
Fq cen (Mhz): 4.922
Bandwidth (%): 31.746
Fq peak (Mhz): 4.922
Fq slew : 1.000

Time Waveform
Abs peak amp : 65.000
Sens (dB): 53.843
Dmpg 1/3 (dB): 1.370
Dmpg 2/4 (dB): 1.514

Analytic Envelope
Rise-10(uSec): .325
Wid-10 (uSec): .775
Wid-25 (uSec): .720
Wid-60 (uSec): .500
Fall-10(uSec): .450

CERTIFIED BY R.A. Dowding DATE 7/1/87
Q.A. C.S. Clement DATE 7/1/87

Power Systems
Combustion Engineering, Inc.

1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500

(203) 688-1911
Telex: 99297

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TRANSDUCER VERIFICATION TESTS

DATE: 21 Feb 89	SYSTEM SERIAL NUMBER: SA-51868
OPERATOR: B. Cushing	TRANSDUCER SERIAL NUMBER: RO-4 (T8353)
VERIFIED ~~BY~~: J. Kanner	SOFTWARE VERSION NUMBER: 4.0

1) Does the vendor's Transducer Characteristic Analysis Sheet contain the following:

		Check if Listed
a)	Customer name	✓
b)	Vendor performing the test	✓
c)	Date performed	✓
d)	Analyst performing the test	✓
e)	Target material	✓
f)	Water travel distance	NO
g)	Peak frequency	✓
h)	Band width center frequency	✓
i)	Band width at -6 dB	NO
j)	Sensitivity (Loop Gain)	NO
k)	Photograph of oscilloscope	
	O Frequency spectrum	✓
	O RF envelope	✓
l)	Pulser/receiver used	✓
m)	Oscilloscope used	NO
n)	Spectrum analyzer used	NO
o)	Excitation voltage used	NO
p)	Attenuation used	✓
q)	Vertical scale description (dB and volts)	✓
r)	Horizontal scale description (frequency and time)	✓
s)	Gain used	✓
t)	Band width used	✓
u)	Transducer type	✓
v)	Transducer serial number	✓
w)	Active area	NO
x)	Type and length of cable used	NO
y)	Water couplant temperature	NO
z)	Sampling rate	✓

2) Was there any damage seen to the transducer while performing the visual examination?

Circle one: Yes **No**

If no, proceed to step 3 of this form.

If yes, note in the space below what type of damage was seen. Send transducer back to vendor.

Observed Damage to Transducer ______________________________

3) Complete the Following Check List

	Completed (Initials)
a) 3 in. x 3 in. x 1 in. glass block on bottom of immersion tank	J.K.
b) At least six inches of water is covering the glass block target	J.K.
c) Transducer is connected to Z-axis arm of immersion tank	J.K.
d) Transmitting face of transducer is parallel to target material	J.K.
e) Transducer is connected to the URBIS	J.K.
f) Transducer face is 4 inches above the target material	J.K.
g) Inspection system is in A-scope mode	J.K.

4) Verify if water temperature is between 68° and 82° Fahrenheit. Note measured temperature below.

Measured Temperature: 76 °F

5) Pulse the system and adjust the gain so the first complete back-wall reflection is at 80 percent full screen height. Note the gain needed.

Gain Reading: 12 db

6) Does in house transducer characteristic analysis match vendor analysis?

Circle one: Yes No

If yes, attach the hard copy presentation of the analysis to this form and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

If no, note in the space below what conditions were rejectable.

Rejectable Conditions The rejectable condition does not reside with the I-98 transducer analysis software. It is due to Low quality fabrication of the transducer itself.

7) Did the in house transducer characteristic analysis match the vendor's sheet on the retry?

Circle one: Yes No

If yes, note in the space below what was done to correct the problem, and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

Actions Taken to Correct Problem

If no, complete a Problem/Failure Report, FORM N. Notify the vendor, send the transducer, copy of the Problem/Failure Report, and a copy of the in house analysis back to the vendor.

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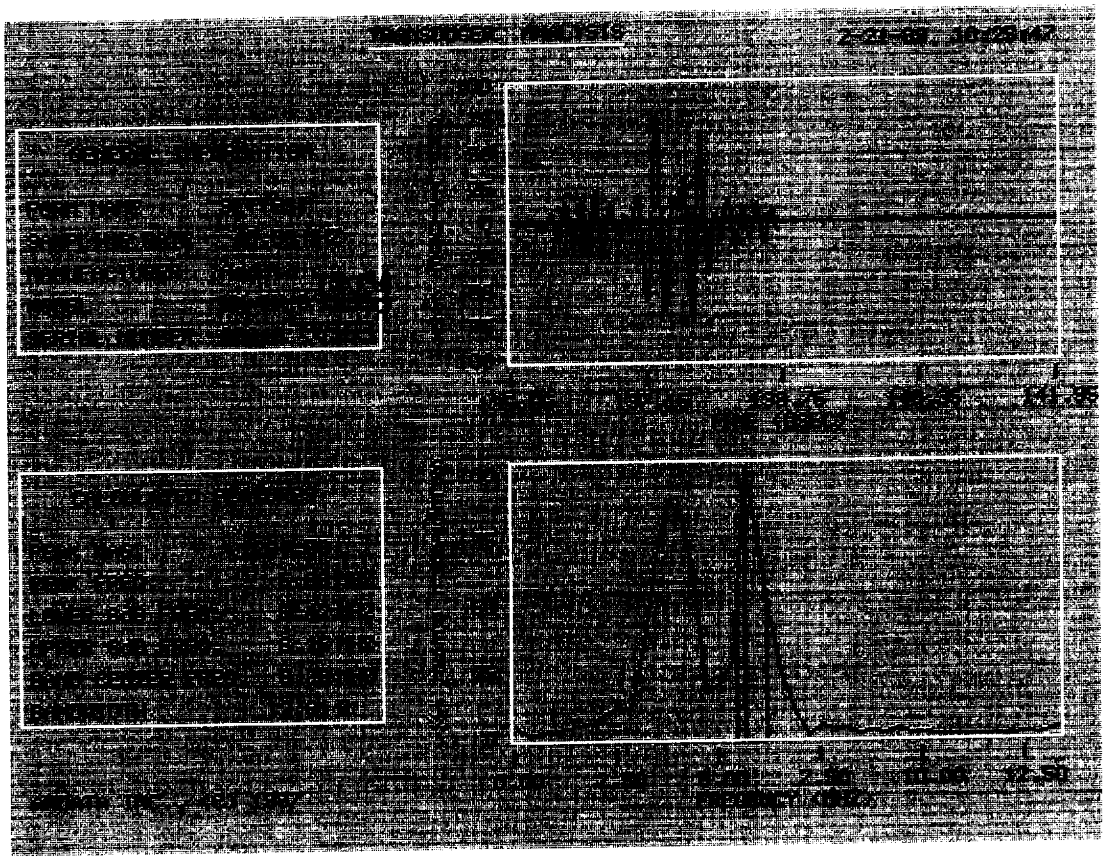

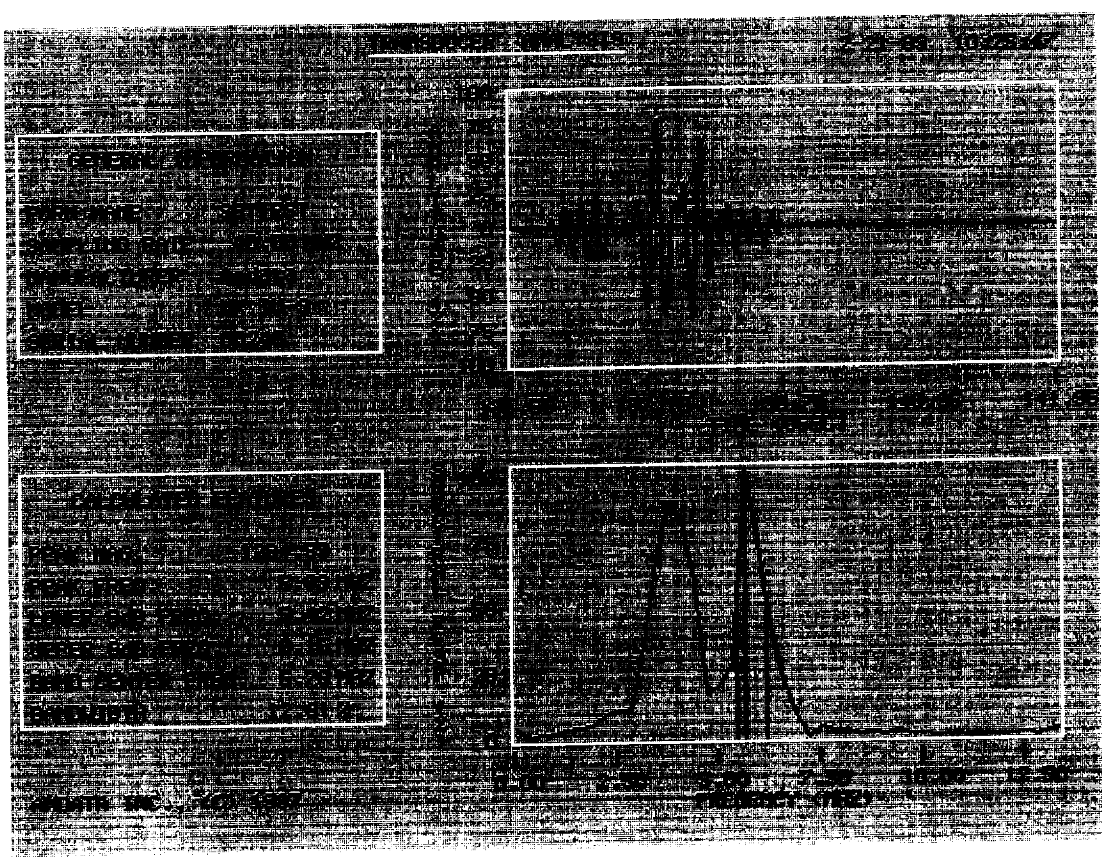

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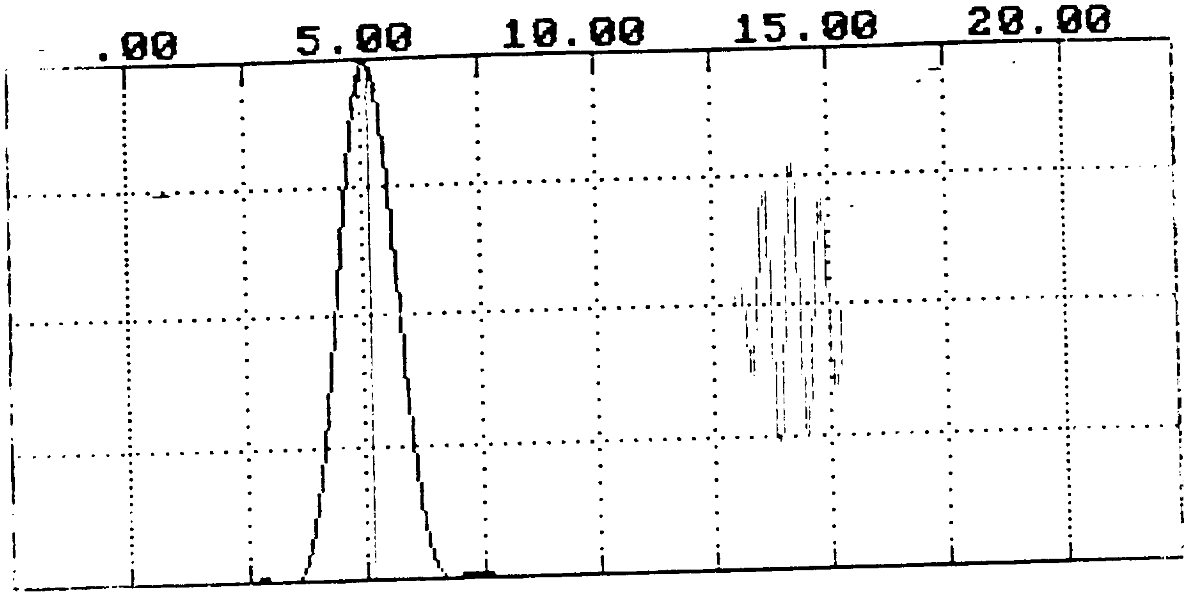
PC-TES TRANSDUCER EVALUATION REPORT



--- power spectrum (Mhz)

MORTHOL

Test Date: JUN 30, 1987 (14:11:5[illegible])   Report Date: JUN 30, 1987 (14:1[illegible])

PULSER RECEIVER PARAMETERS

Model : 5052PR
Serial # : PR/889
Energy : 1
Gain (dB) : 20
Atten.(dB) : 20
Damping : 4
HP Filt.: Out
BP Filt.: N/A

TRANSDUCER PARAMETERS

Model : TS-196
Serial # : T8350
Diameter : .750
Center Freq. : 5.0 MHZ
Shoe Type : N/A
Couplant : WATER

DATA COLLECTION PARAMETERS

Samp Rate (Mhz) : 40.000
Gate length (usec) : .800

FEATURES

Power Spectrum
Low 3dB (Mhz): 4.375
High 3dB(Mhz): 5.859
Fr cen (Mhz): 5.117
Bandwidth (%): 29.006
Fp peak (Mhz): 5.156
Skew : 1.111

Time Waveform
Abs peak amp : 7[illegible].000
Sens (dB): 5[illegible].758
Dmpg 1-2 (dB): 1.346
Dmpg 2-4 (dB): 1.488

Analytic Envelope
Rise-10(uSec): [illegible]
Wid-10 (uSec): [illegible]
Wid-25 (uSec): [illegible]
Wid-60 (uSec): [illegible]
Fall-10(uSec): .4[illegible]

CERTIFIED BY R.A. Dawkins DATE 6/30/87
Q.A. C.J. Blomquist DATE 7/1/87

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Combustion Engineering, Inc.
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TRANSDUCER VERIFICATION TESTS

DATE: 9 March 89

OPERATOR: Brad Cushing

VERIFIED BY:

SYSTEM SERIAL NUMBER: 9A5186S

TRANSDUCER SERIAL NUMBER: RD-3 (TS354)

SOFTWARE VERSION NUMBER: 4.0

1) Does the vendor's Transducer Characteristic Analysis Sheet contain the following:

	Item	Check if Listed
a)	Customer name	✓
b)	Vendor performing the test	✓
c)	Date performed	✓
d)	Analyst performing the test	✓
e)	Target material	✓
f)	Water travel distance	NO
g)	Peak frequency	✓
h)	Band width center frequency	✓
i)	Band width at -6 dB	NO
j)	Sensitivity (Loop Gain)	NO
k)	Photograph of oscilloscope	
	O Frequency spectrum	✓
	O RF envelope	✓
l)	Pulser/receiver used	✓
m)	Oscilloscope used	NO
n)	Spectrum analyzer used	NO
o)	Excitation voltage used	NO
p)	Attenuation used	✓
q)	Vertical scale description (dB and volts)	✓
r)	Horizontal scale description (frequency and time)	✓
s)	Gain used	✓
t)	Band width used	✓
u)	Transducer type	✓
v)	Transducer serial number	✓
w)	Active area	NO
x)	Type and length of cable used	NO
y)	Water couplant temperature	✓
z)	Sampling rate	✓

2) Was there any damage seen to the transducer while performing the visual examination?

Circle one: Yes No

If no, proceed to step 3 of this form.

If yes, note in the space below what type of damage was seen. Send transducer back to vendor.

Observed Damage to Transducer ______________________

3) Complete the Following Check List

	Completed (Initials)
a) 3 in. x 3 in. x 1 in. glass block on bottom of immersion tank	BSC
b) At least six inches of water is covering the glass block target	BSC
c) Transducer is connected to Z-axis arm of immersion tank	BSC
d) Transmitting face of transducer is parallel to target material	BSC
e) Transducer is connected to the URBIS	BSC
f) Transducer face is 4 inches above the target material	BSC
g) Inspection system is in A-scope mode	BSC

4) Verify if water temperature is between 68° and 82° Fahrenheit. Note measured temperature below.

Measured Temperature: 76°

5) Pulse the system and adjust the gain so the first complete back-wall reflection is at 80 percent full screen height. Note the gain needed.

Gain Reading: 18db

6) Does in house transducer characteristic analysis match vendor analysis?

Circle one: Yes No

If yes, attach the hard copy presentation of the analysis to this form and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

If no, note in the space below what conditions were rejectable.

Rejectable Conditions The rejectable condition does not reside with the I-98 transducer analysis software. It is due to Low quality fabrication of the transducer itself.

7) Did the in house transducer characteristic analysis match the vendor's sheet on the retry?

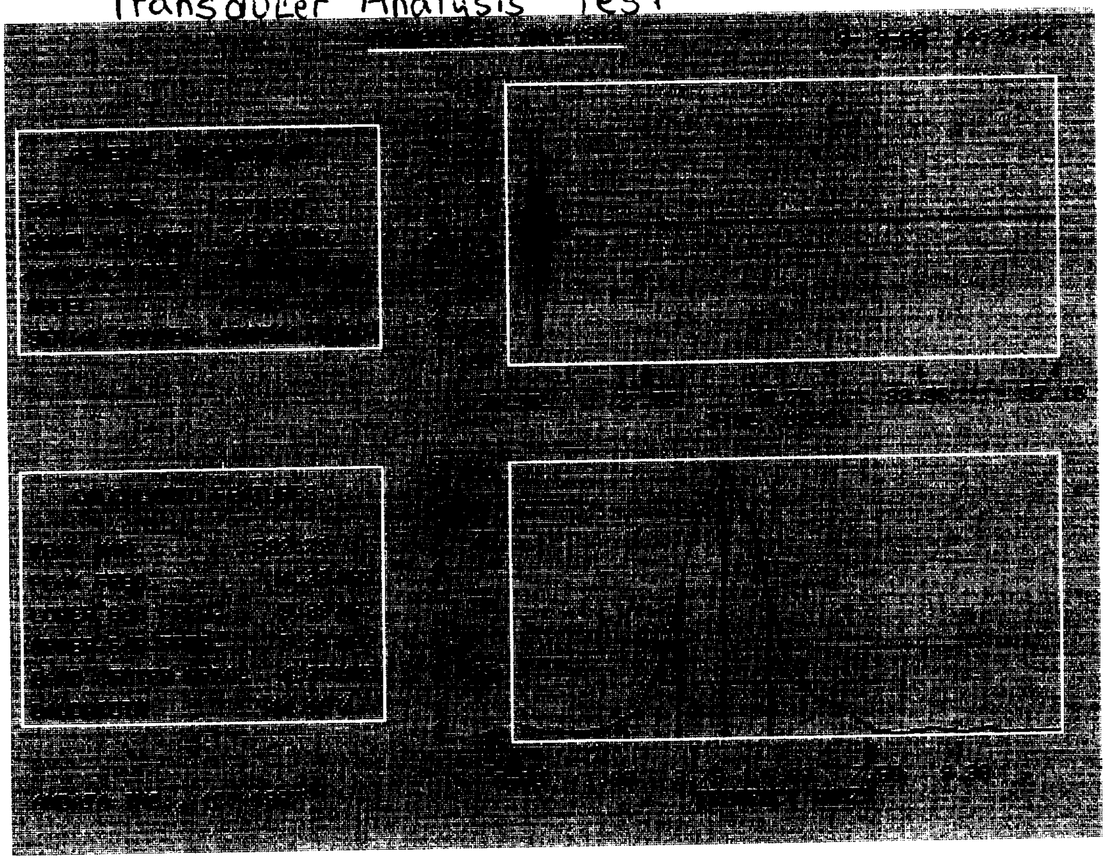
Circle one: Yes No

If yes, note in the space below what was done to correct the problem, and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

Actions Taken to Correct Problem

If no, complete a Problem/Failure Report, FORM N. Notify the vendor, send the transducer, copy of the Problem/Failure Report, and a copy of the in house analysis back to the vendor.

Transducer Analysis Test



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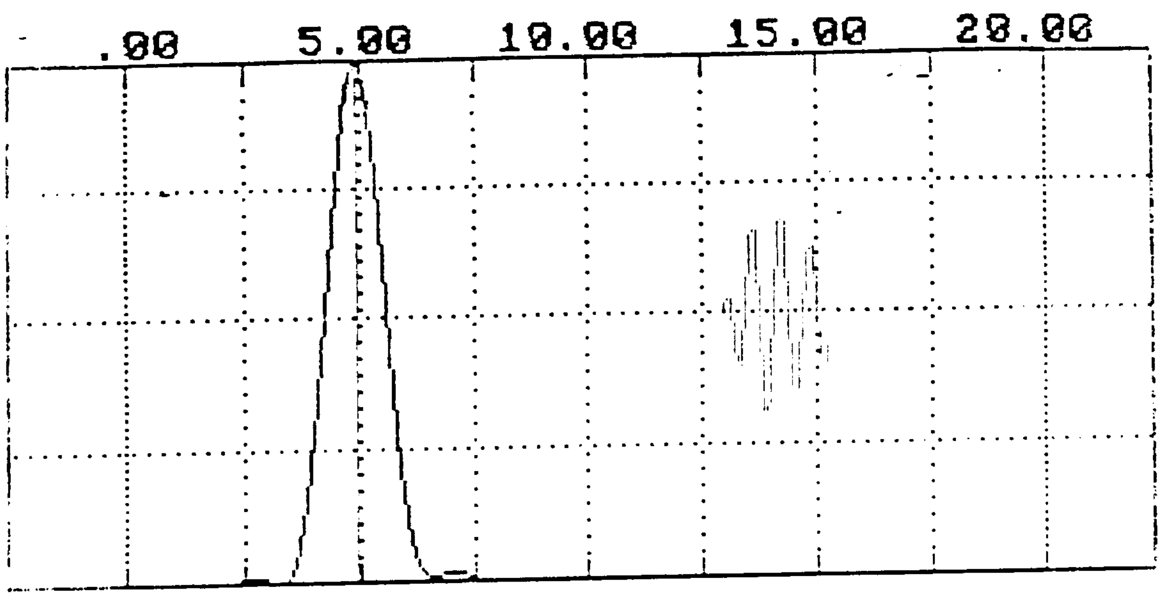
PC-TES TRANSDUCER EVALUATION REPORT



--- power spectrum (Mhz)

MORTHOL

Test Date: JUN 30, 1987 (14:53:24) Report Date: [illegible]

PULSER RECEIVER PARAMETERS

[illegible] : 5052PR	Energy : 1	Damping : [illegible]
[illegible] # : PR/889	Gain (dB) : 20	HP Filt.: [illegible]
	Atten.(dB): 20	BP Filt.: [illegible]

TRANSDUCER PARAMETERS

Model : TS-196	Diameter : .750	Shoe Type : N/A
[illegible] : T8234	Center Freq. : 5.0 MHZ	Couplant : WATER

DATA COLLECTION PARAMETERS

[illegible] Rate (Mhz) : 40.000 Gate length (usec) : .8[illegible]

FEATURES

Power Spectrum		Time Waveform		Analytic Envelope	
Low 3dB (Mhz):	4.219	Abs peak amp :	[illegible]	Rise-10(uSec):	.[illegible]
High 3dB(Mhz):	5.625	Sens (dB):	51.660	Wid-10 (uSec):	.[illegible]
Fq cen (Mhz):	4.922	Dmpg 1/2 (dB):	1.29[illegible]	Wid-25 (uSec):	.[illegible]
Bandwidth (%):	28.571	Dmpg 2/4 (dB):	1.344	Wid-50 (uSec):	.55[illegible]
Fq peak (Mhz):	4.922			Fall-10(uSec):	.[illegible]
[illegible] :	1.000				

CERTIFIED BY *[signature]* DATE *6/30/87*
Q.A. *[signature]* DATE *7/1/87*

Power Systems
Combustion Engineering, Inc.

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Windsor, Connecticut 06095-0500

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TRANSDUCER VERIFICATION TESTS

DATE: 25 May 89

OPERATOR: B. Cushing

VERIFIED BY: [illegible] 5/25/89

SYSTEM SERIAL NUMBER: SA 51869

TRANSDUCER SERIAL NUMBER: RND-3 (TS3541)

SOFTWARE VERSION NUMBER: 4.0

1) Does the vendor's Transducer Characteristic Analysis Sheet contain the following:

		Check if Listed
a)	Customer name	✓
b)	Vendor performing the test	✓
c)	Date performed	✓
d)	Analyst performing the test	✓
e)	Target material	NO
f)	Water travel distance	NO
g)	Peak frequency	✓
h)	Band width center frequency	✓
i)	Band width at -6 dB	NO
j)	Sensitivity (Loop Gain)	✓
k)	Photograph of oscilloscope	
	O Frequency spectrum	NO
	O RF envelope	NO
l)	Pulser/receiver used	✓
m)	Oscilloscope used	✓
n)	Spectrum analyzer used	✓
o)	Excitation voltage used	✓
p)	Attenuation used	✓
q)	Vertical scale description (dB and volts)	NO
r)	Horizontal scale description (frequency and time)	✓
s)	Gain used	✓
t)	Band width used	✓
u)	Transducer type	✓
v)	Transducer serial number	✓
w)	Active area	✓
x)	Type and length of cable used	NO
y)	Water couplant temperature	NO
z)	Sampling rate	✓

2) Was there any damage seen to the transducer while performing the visual examination?

Circle one: Yes No

If no, proceed to step 3 of this form.

If yes, note in the space below what type of damage was seen. Send transducer back to vendor.

Observed Damage to Transducer ____________________

3) Complete the Following Check List

	Completed (Initials)
a) 3 in. x 3 in. x 1 in. glass block on bottom of ~~immersion tank~~ Aluminum Block	BSC
b) At least six inches of water is covering the glass block target	BSC
c) Transducer is connected to Z-axis arm of immersion tank	BSC
d) Transmitting face of transducer is parallel to target material	BSC
e) Transducer is connected to the URBIS	BSC
f) Transducer face is 4 inches above the target material	BSC
g) Inspection system is in A-scope mode	BSC

4) Verify if water temperature is between 68° and 82° Fahrenheit. Note measured temperature below.

Measured Temperature: 75° F

5) Pulse the system and adjust the gain so the first complete back-wall reflection is at 80 percent full screen height. Note the gain needed.

Gain Reading: 13.0 db

6) Does in house transducer characteristic analysis match vendor analysis?

Circle one: Yes **No**

If yes, attach the hard copy presentation of the analysis to this form and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

If no, note in the space below what conditions were rejectable.

Rejectable Conditions The rejectable condition does not reside with the I-98 transducer analysis software but due to low quality fabrication of transducer itself.

7) Did the in house transducer characteristic analysis match the vendor's sheet on the retry?

Circle one: Yes No

If yes, note in the space below what was done to correct the problem, and proceed to the verification test of the electromagnetic interference shielding of data acquisition cables.

Actions Taken to Correct Problem

If no, complete a Problem/Failure Report, FORM N. Notify the vendor, send the transducer, copy of the Problem/Failure Report, and a copy of the in house analysis back to the vendor.

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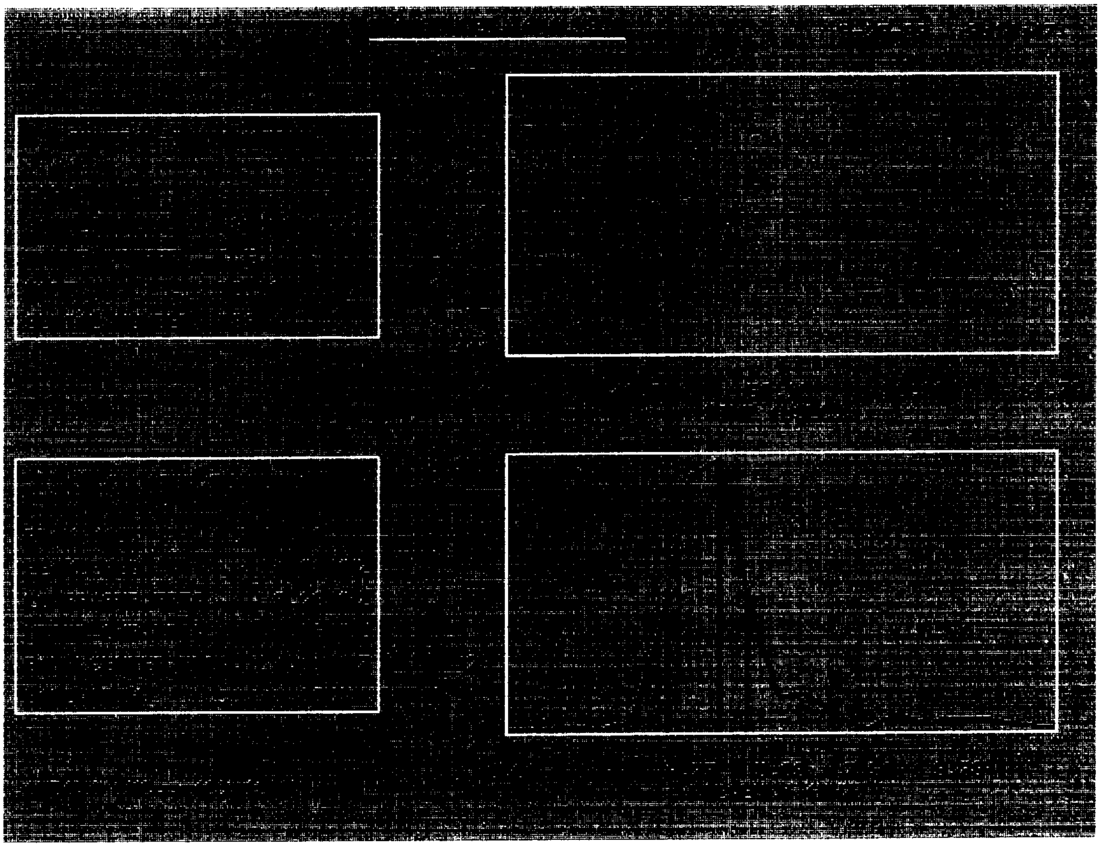
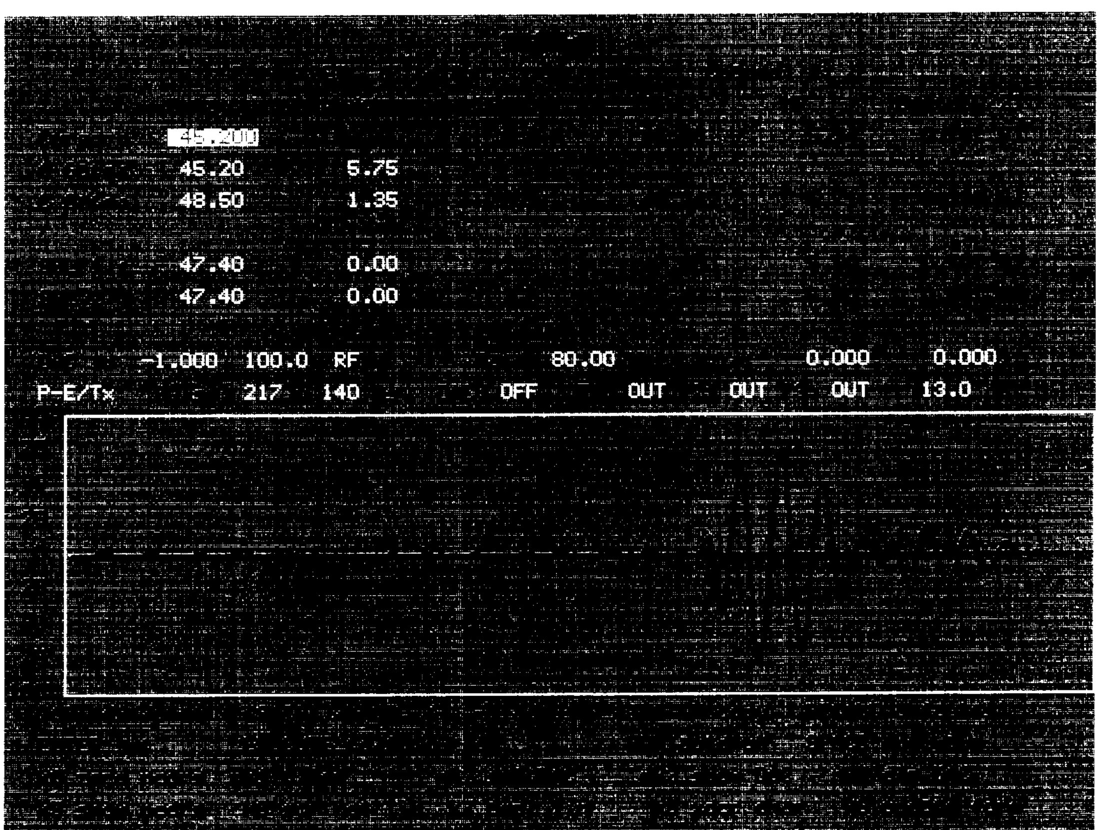
COLOR PHOTOGRAPH





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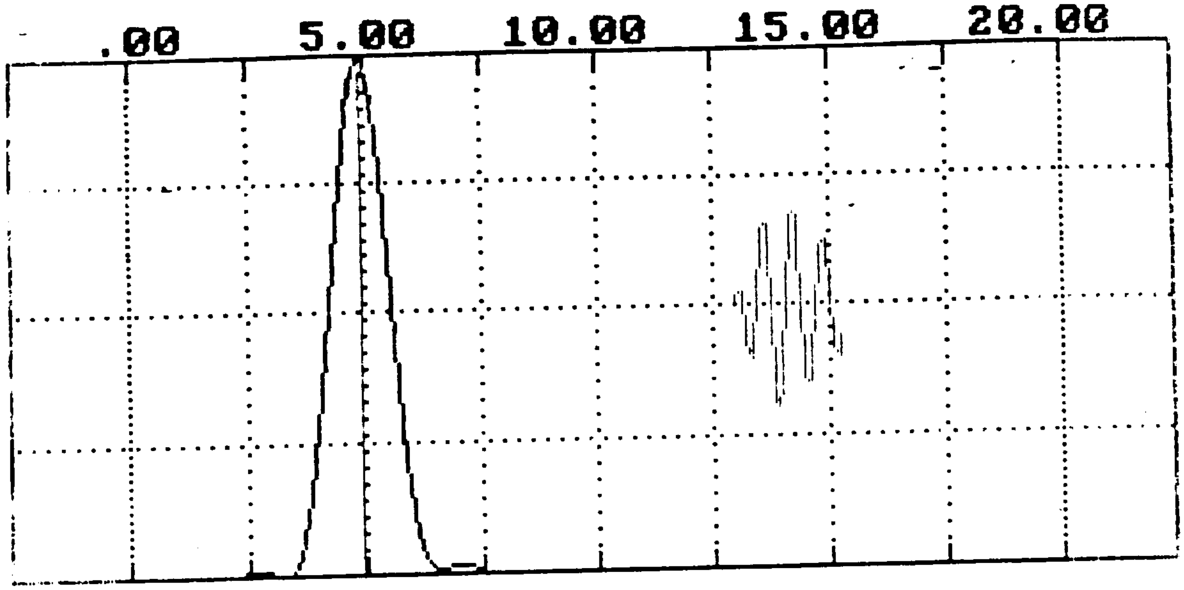
PC-TES TRANSDUCER EVALUATION REPORT



--- power spectrum (Mhz)

MORTHOL

Test Date: JUN 30, 1987 (14:53:34)   Report Date: JUN 30, 1987 (14:5[illegible])

PULSER/RECEIVER PARAMETERS

Model : 5052PR
Serial # : PR/884

Energy : 1
Gain (dB) : 20
Atten. (dB) : 20

Damping : 4
HP Filt.: Out
BP Filt.: N/A

TRANSDUCER PARAMETERS

Model : TS-196
Serial # : T6254

Diameter : .750
Center Freq. : 5.0 MHZ

Shoe Type : N/A
Couplant : WATER

DATA COLLECTION PARAMETERS

Sample Rate (Mhz) : 40.000
Gate length (usec) : .800

FEATURES

Power Spectrum

Low 3dB (Mhz): 4.219
High 3dB (Mhz): 5.625
Fq cen (Mhz): 4.922
Bandwidth (%): 28.571
Fq peak (Mhz): 4.922
Fq [illegible] : 1.000

Time Waveform

Abs peak amp : 49.000
Sens (dB): 51.660
Dmpg 1/3 (dB): 1.289
Dmpg 2/4 (dB): 1.394

Analytic Envelope

Rise-10 (uSec): .350
Wid-10 (uSec): .775
Wid-25 (uSec): .750
Wid-60 (uSec): .550
Fall-10 (uSec): .425

CERTIFIED BY R.A. Dowding DATE 6/30/87
Q.A. C.P. Blomquist DATE 7/1/87

Power Systems
Combustion Engineering, Inc.

1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500

(203) 688-1911
Telex: 99297

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ELECTROMAGNETIC INTERFERENCE SHIELDING DATA ACQUISITION CABLE VERIFICATION TEST

DATE: 2/17/89

OPERATOR: Brad Cushing

VOLTAGE OF LINE SYSTEM IS RUNNING ON: 110

VERIFIED BY: [illegible signature]

SYSTEM SERIAL NUMBER: 5-A51866

CABLE I.D. NUMBER: ~~[illegible]~~ AWM-2493

TRANSDUCER SERIAL NUMBER

SOFTWARE VERSION NUMBER: C

1) COMPLETE CHECK LIST BEFORE PROCEEDING WITH VERIFICATION TEST

	COMPLETED (INITIALS)
a) SYSTEM IS CONNECTED ON SAME ELECTRICAL LINES AS AUTOCLAVE(S)	BSC
b) 5.0 MHz TRANSDUCER IS BEING USED	BSC
c) SYSTEM IS IN THE A-SCOPE MODE	BSC
d) PEAK DETECTING OFF EIGHT MULTIPLE BACK-WALL REFLECTION	BSC
e) SIGNAL RESPONSE IS SET TO 35% FSH OFF A BONDED REGION	BSC

2) STATE THE TIME THE AUTOCLAVE CYCLING BEGAN: ______________

3) NOTE SIGNAL RESPONSE EVERY HOUR ON THE HOUR IN THE SPACE PROVIDED BELOW.

TIME	SIGNAL RESPONSE (% FSH)
0900	35.[illegible]
1000	34.4
1100	34.4
1200	34.9

4) DID SIGNAL RESPONSE VARY BY MORE THAN 10% AT ANY TIME DURING THE TEST?

CIRCLE ONE: YES NO

IF NO, PROCEED TO Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

IF YES, NOTE IN THE SPACE PROVIDED BELOW, THE TIME(S) AT WHICH THIS DEVIATION OCCURRED.

TIME	SIGNAL RESPONSE

ALSO COMPLETE A PROBLEM/FAILURE REPORT, FORM N. NOTIFY MTI ELECTRONIC MAINTENANCE OF THE DISCREPANCY.

***NOTE: BY PLACING THE INSPECTION SYSTEM IN THE VICINITY OF THE AUTOCLAVES REPRESENTS THE WORST CASE ELECTRONIC ENVIRONMENT THAT THE SYSTEM WILL EXPERIENCE.

*Note: system was run ~~by auto~~ during auto clave operation. Also system was exposed to ~~Electromagnetic~~ more intense electromagnetic Interferance by placing a magnetic yoke on various components of the system and on the umbilical cabeling. No change in signal response was noted.

ELECTROMAGNETIC INTERFERENCE SHIELDING
DATA ACQUISITION CABLE
VERIFICATION TEST

DATE: 29 1 4 99

OPERATOR: Brad Cushing

VOLTAGE OF LINE SYSTEM IS RUNNING ON: 110

VERIFIED BY:

SYSTEM SERIAL NUMBER: S/A 51868

CABLE I.D. NUMBER: 5 AMW-2493

TRANSDUCER SERIAL NUMBER: T8353

SOFTWARE VERSION NUMBER: 4.0

1) COMPLETE CHECK LIST BEFORE PROCEEDING WITH VERIFICATION TEST

	COMPLETED (INITIALS)
a) SYSTEM IS CONNECTED ON SAME ELECTRICAL LINES AS AUTOCLAVE(S)	BSC
b) 5.0 MHz TRANSDUCER IS BEING USED	BSC
c) SYSTEM IS IN THE A-SCOPE MODE	BSC
d) PEAK DETECTING OFF EIGHT MULTIPLE BACK-WALL REFLECTION	BSC
e) SIGNAL RESPONSE IS SET TO 35% FSH OFF A BONDED REGION	B

2) STATE THE TIME THE AUTOCLAVE CYCLING BEGAN: ______

3) NOTE SIGNAL RESPONSE EVERY HOUR ON THE HOUR IN THE SPACE PROVIDED BELOW.

TIME	SIGNAL RESPONSE (% FSH)
0720	36.2
0820	35.9
0920	36.2
1020	36.2

4) DID SIGNAL RESPONSE VARY BY MORE THAN 10% AT ANY TIME DURING THE TEST?

CIRCLE ONE: YES NO

IF NO, PROCEED TO Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

IF YES, NOTE IN THE SPACE PROVIDED BELOW, THE TIME(S) AT WHICH THIS DEVIATION OCCURRED.

TIME	SIGNAL RESPONSE

ALSO COMPLETE A PROBLEM/FAILURE REPORT, FORM N. NOTIFY MTI ELECTRONIC MAINTENANCE OF THE DISCREPANCY.

***NOTE: BY PLACING THE INSPECTION SYSTEM IN THE VICINITY OF THE AUTOCLAVES REPRESENTS THE WORST CASE ELECTRONIC ENVIRONMENT THAT THE SYSTEM WILL EXPERIENCE.

Note - System was run during autoclave operation. However it was also exposed to E.M.I by means of a magnetic yoke. This had no effect on signal response.

ELECTROMAGNETIC INTERFERENCE SHIELDING DATA ACQUISITION CABLE VERIFICATION TEST

DATE: 9 March 89

OPERATOR: Brad Cushing

VOLTAGE OF LINE SYSTEM IS RUNNING ON: 110

VERIFIED BY:

SYSTEM SERIAL NUMBER: SA51865

CABLE I.D. NUMBER: AWM-2493

TRANSDUCER SERIAL NUMBER RD-3

SOFTWARE VERSION NUMBER: 4.0

1) COMPLETE CHECK LIST BEFORE PROCEEDING WITH VERIFICATION TEST

	COMPLETED (INITIALS)
a) SYSTEM IS CONNECTED ON SAME ELECTRICAL LINES AS AUTOCLAVE(S)	BSC
b) 5.0 MHz TRANSDUCER IS BEING USED	BSC
c) SYSTEM IS IN THE A-SCOPE MODE	BSC
d) PEAK DETECTING OFF EIGHT MULTIPLE BACK-WALL REFLECTION	BSC
e) SIGNAL RESPONSE IS SET TO 35% FSH OFF A BONDED REGION	BSC

2) STATE THE TIME THE AUTOCLAVE CYCLING BEGAN: ______________

3) NOTE SIGNAL RESPONSE EVERY HOUR ON THE HOUR IN THE SPACE PROVIDED BELOW.

TIME	SIGNAL RESPONSE (% FSH)
0920	35.9
1020	36.2
1120	36.2
1220	36.2

4) DID SIGNAL RESPONSE VARY BY MORE THAN 10% AT ANY TIME DURING THE TEST?

CIRCLE ONE: YES NO

IF NO, PROCEED TO Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

IF YES, NOTE IN THE SPACE PROVIDED BELOW, THE TIME(S) AT WHICH THIS DEVIATION OCCURRED.

TIME	SIGNAL RESPONSE

ALSO COMPLETE A PROBLEM/FAILURE REPORT, FORM N. NOTIFY MTI ELECTRONIC MAINTENANCE OF THE DISCREPANCY.

***NOTE: BY PLACING THE INSPECTION SYSTEM IN THE VICINITY OF THE AUTOCLAVES REPRESENTS THE WORST CASE ELECTRONIC ENVIRONMENT THAT THE SYSTEM WILL EXPERIENCE.

* Note: System was run during autoclave operation. However it was also exposed to intense electromagnetic interference by placing a magnetic yoke by system components and cabeling. This had no affect on signal response.

ELECTROMAGNETIC INTERFERENCE SHIELDING
DATA ACQUISITION CABLE
VERIFICATION TEST

DATE: 23 May 89

OPERATOR: B. Cushing

VOLTAGE OF LINE SYSTEM IS RUNNING ON: 110

VERIFIED BY: [signature] 5/23/89

SYSTEM SERIAL NUMBER: SA51869

CABLE I.D. NUMBER: SA51869 (AMW2493)

TRANSDUCER SERIAL NUMBER RND-3

SOFTWARE VERSION NUMBER: 4.0

1) COMPLETE CHECK LIST BEFORE PROCEEDING WITH VERIFICATION TEST

		COMPLETED (INITIALS)
a)	SYSTEM IS CONNECTED ON SAME ELECTRICAL LINES AS AUTOCLAVE(S)	BSC
b)	5.0 MHz TRANSDUCER IS BEING USED	BSC
c)	SYSTEM IS IN THE A-SCOPE MODE	BSC
d)	PEAK DETECTING OFF EIGHT MULTIPLE BACK-WALL REFLECTION	BSC
e)	SIGNAL RESPONSE IS SET TO 35% FSH OFF A BONDED REGION	BSC

2) STATE THE TIME THE AUTOCLAVE CYCLING BEGAN: ______

3) NOTE SIGNAL RESPONSE EVERY HOUR ON THE HOUR IN THE SPACE PROVIDED BELOW.

TIME	SIGNAL RESPONSE (% FSH)
~~0100~~ 1100	35.0
1200	35.2
1300	35.4
1400	35.2

4) DID SIGNAL RESPONSE VARY BY MORE THAN 10% AT ANY TIME DURING THE TEST?

CIRCLE ONE: YES NO

IF NO, PROCEED TO Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

IF YES, NOTE IN THE SPACE PROVIDED BELOW, THE TIME(S) AT WHICH THIS DEVIATION OCCURRED.

TIME	SIGNAL RESPONSE

ALSO COMPLETE A PROBLEM/FAILURE REPORT, FORM N. NOTIFY MTI ELECTRONIC MAINTENANCE OF THE DISCREPANCY.

***NOTE: BY PLACING THE INSPECTION SYSTEM IN THE VICINITY OF THE AUTOCLAVES REPRESENTS THE WORST CASE ELECTRONIC ENVIRONMENT THAT THE SYSTEM WILL EXPERIENCE.

Note - System was run during autoclave operation. However it was also exposed to intense E.M.I by placing a magnetic yoke near system components and cabeling. This had no effect on signal response.

Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 2/7/89
OPERATOR: [illegible]
VERIFIED BY: [illegible]

SYSTEM SERIAL NUMBER: S-AS1866
TRANSDUCER SERIAL NUMBER: TS-196

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	[illegible]
b) 20.0 in. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	[illegible]
c) SAMPLING INCREMENT IS 0.10 in.	[illegible]
d) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	[illegible]
e) ENCODERS HAVE BEEN ZEROED AT START LOCATION	[illegible]
f) THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 in. IN THE +Y DIRECTION.	[illegible]

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1	16.0	15.2	0.8
RUN 2	16.0	15.2	0.8
RUN 3	16.0	15.2	0.8

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

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(3 CONT.) IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1	16.0	16.1	0.1
RUN 2	16.0	16.1	0.1
RUN 3	16.0	16.1	0.1

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL Y-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

CORRECTIVE ACTION(S) CHANGED RESOLUTION VALUE FROM 102- 109 FOR 10 IN SCANNER
NOTE, VALUES WILL BE DIFFERENT FOR EACH SCANNER.
SCANNER USED S-45188E F

IF THE DIFFERENCE BETWEEN THE TWO READINGS ARE STILL OUT OF TOLERANCE, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

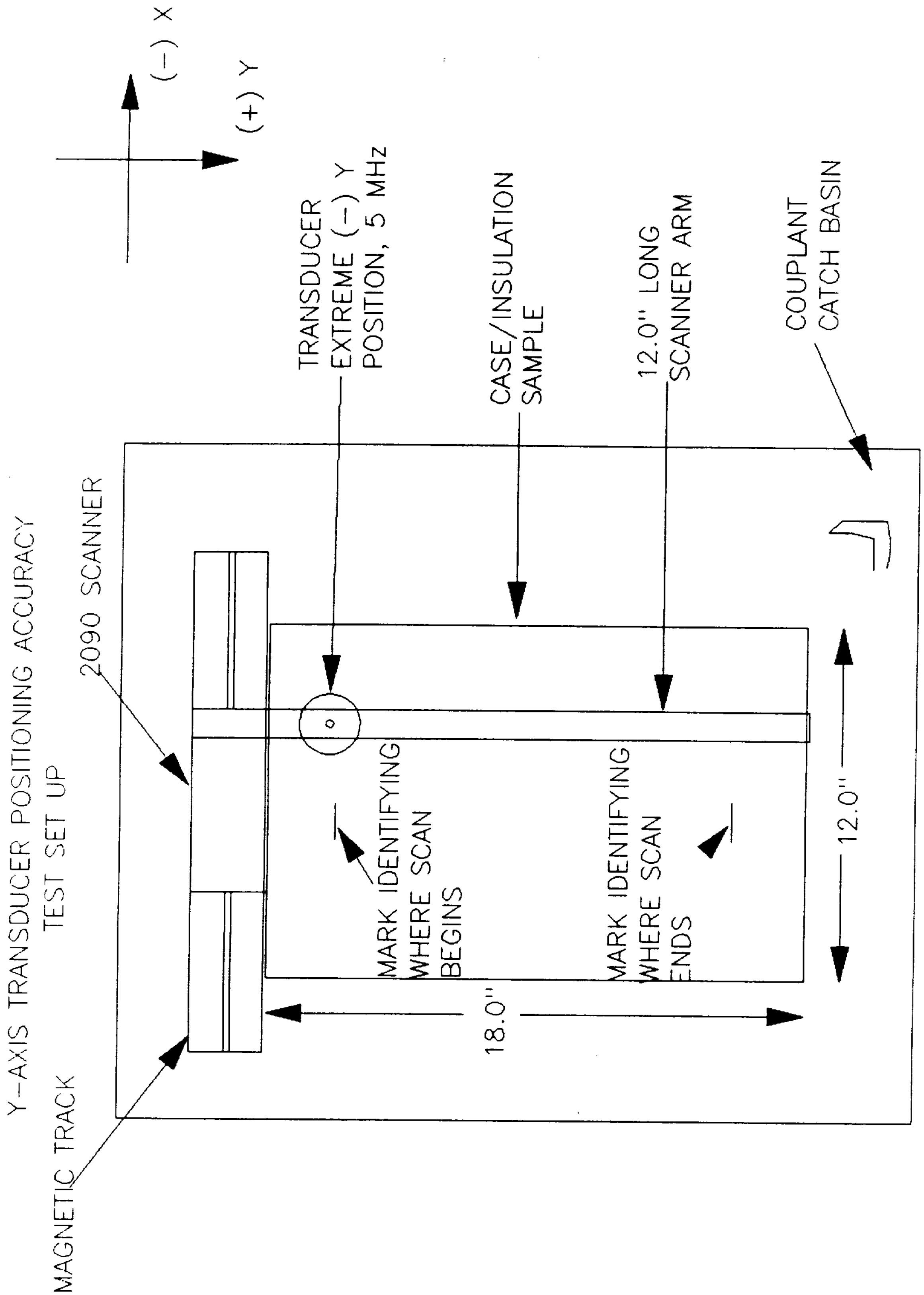
Y-AXIS TRANSDUCER POSITIONING ACCURACY
TEST SET UP
(-) X
(+) Y
TRANSDUCER
EXTREME (-) Y
POSITION, 5 MHz
CASE/INSULATION
SAMPLE
12.0" LONG
SCANNER ARM
COUPLANT
CATCH BASIN
2090 SCANNER
MAGNETIC TRACK
MARK IDENTIFYING
WHERE SCAN
BEGINS
MARK IDENTIFYING
WHERE SCAN
ENDS
18.0"
12.0"

FIGURE 1

Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 21 Feb 89
OPERATOR: B. Cushing
VERIFIED BY: J. Kamer

SYSTEM SERIAL NUMBER: SA-51868
TRANSDUCER SERIAL NUMBER: T8353

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 20.0 in. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	BSC
c) SAMPLING INCREMENT IS 0.10 in.	BSC
d) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
e) ENCODERS HAVE BEEN ZEROED AT START LOCATION	BSC
f) THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE ~~16.0~~ 16.0 in. IN THE +Y DIRECTION.	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
* RUN 1	0"	Same	0
RUN 2	0"	Same	0
RUN 3	0"	Same	0

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

* Scan parameters are 0"–5" y and 0"-5" x at .10 increments
Ran scan three times and noted where y position was at the end of each scan.

(3 CONT.) IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1	____________	____________	__________
RUN 2	____________	____________	__________
RUN 3	____________	____________	__________

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL Y-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

CORRECTIVE ACTION(S) ________________________________

IF THE DIFFERENCE BETWEEN THE TWO READINGS ARE STILL OUT OF TOLERANCE, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

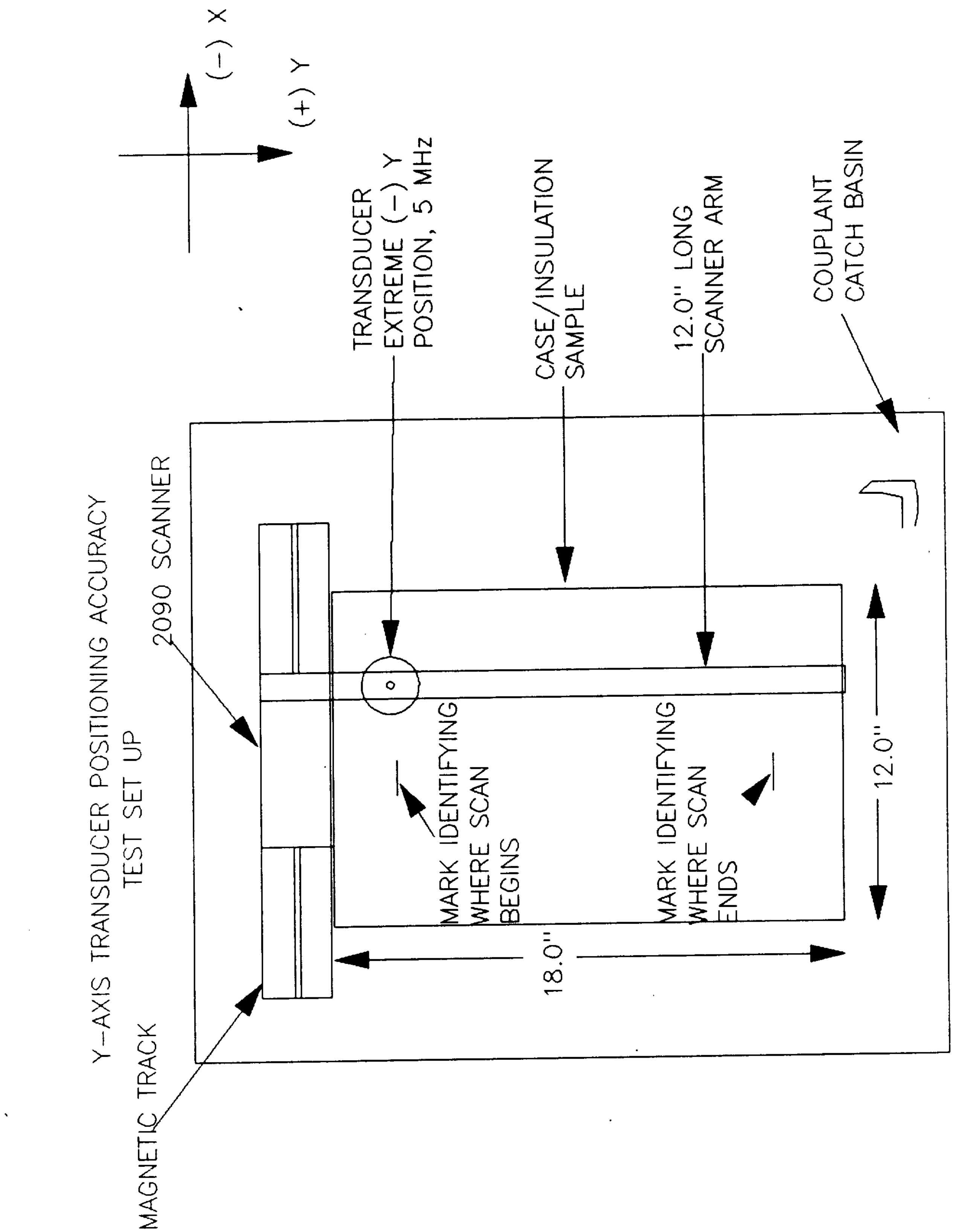
Y-AXIS TRANSDUCER POSITIONING ACCURACY
TEST SET UP
(−) X
(+) Y
TRANSDUCER
EXTREME (−) Y
POSITION, 5 MHz
CASE/INSULATION
SAMPLE
12.0" LONG
SCANNER ARM
COUPLANT
CATCH BASIN
2090 SCANNER
MARK IDENTIFYING
WHERE SCAN
BEGINS
MARK IDENTIFYING
WHERE SCAN
ENDS
12.0"
18.0"
MAGNETIC TRACK

FIGURE 1

Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 9 Mar 89

OPERATOR: Brad Cushing

VERIFIED BY: [illegible]

SYSTEM SERIAL NUMBER: SA51865

TRANSDUCER SERIAL NUMBER: RD-3

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	20.0 in. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	BSC
c)	SAMPLING INCREMENT IS 0.10 in.	BSC
d)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
e)	ENCODERS HAVE BEEN ZEROED AT START LOCATION	BSC
f)	THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 in. IN THE +Y DIRECTION.	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1	16.0"	16.0"	None
RUN 2	16.0"	16.0"	None
RUN 3	16.0"	16.0"	None

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

(3 CONT.) IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1	____________	____________	____________
RUN 2	____________	____________	____________
RUN 3	____________	____________	____________

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL Y-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

CORRECTIVE ACTION(S) ________________________________
____
____
____
____
____

IF THE DIFFERENCE BETWEEN THE TWO READINGS ARE STILL OUT OF TOLERANCE, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

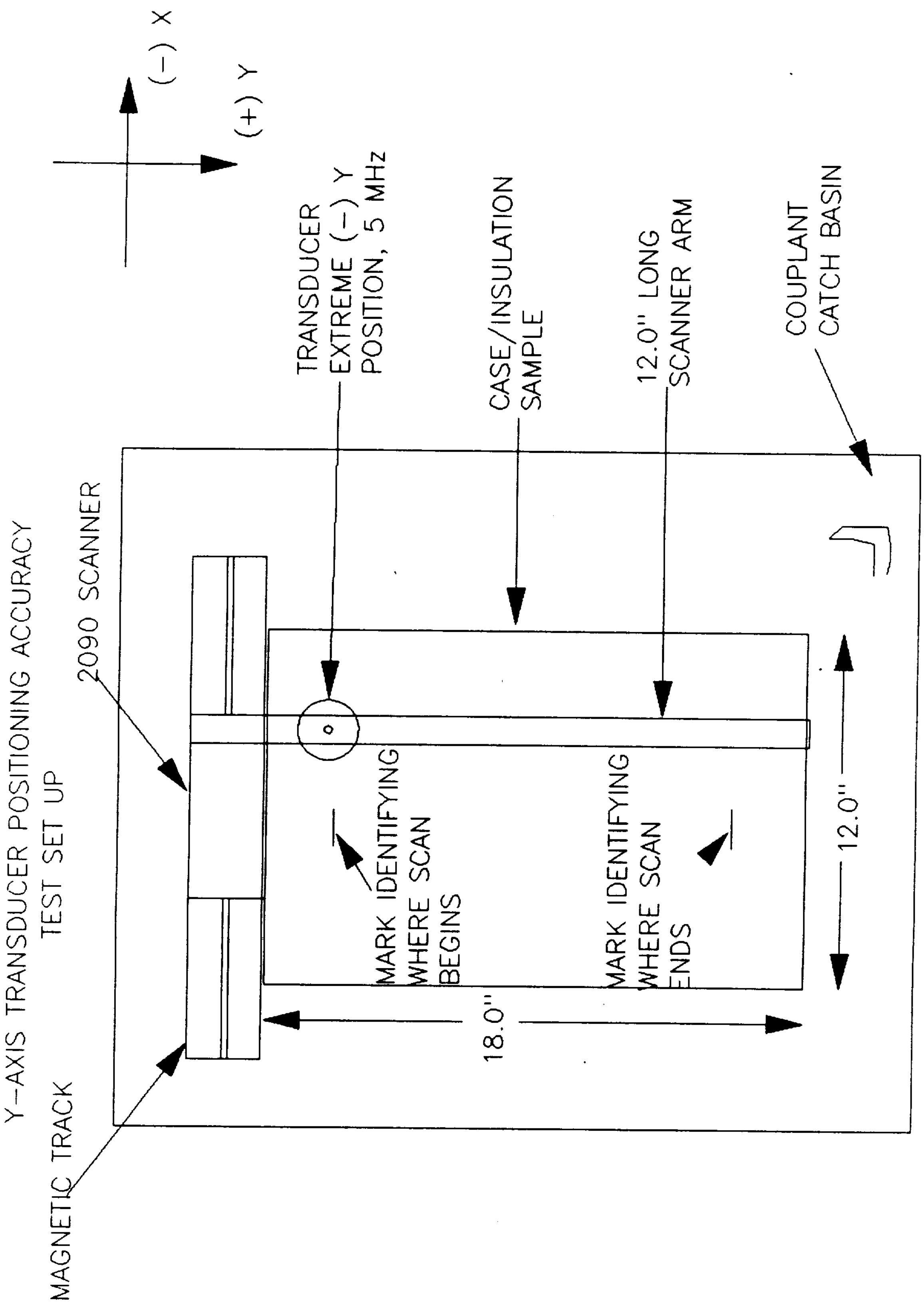
Y-AXIS TRANSDUCER POSITIONING ACCURACY
TEST SET UP
(-) X
(+) Y
TRANSDUCER
EXTREME (-) Y
POSITION, 5 MHz
CASE/INSULATION
SAMPLE
12.0" LONG
SCANNER ARM
COUPLANT
CATCH BASIN
2090 SCANNER
MAGNETIC TRACK
MARK IDENTIFYING
WHERE SCAN
BEGINS
MARK IDENTIFYING
WHERE SCAN
ENDS
18.0"
12.0"

FIGURE 1

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Y-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 15 May 89

OPERATOR: B. [illegible]

VERIFIED BY: [illegible] 5/15/89

SYSTEM SERIAL NUMBER: SA 51881

TRANSDUCER SERIAL NUMBER: RND - 3

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 20.0 in. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	BSC
c) SAMPLING INCREMENT IS 0.10 in.	BSC
d) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
e) ENCODERS HAVE BEEN ZEROED AT START LOCATION	BSC
f) THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 in. IN THE +Y DIRECTION.	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1	16.0	16.0	0
RUN 2	16.0	16.0	0
RUN 3	16.0	16.0	0

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

(3 CONT.) IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED Y-AXIS POSITION	ACTUAL Y-AXIS POSITION	DELTA
RUN 1			
RUN 2			
RUN 3			

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL Y-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE BETWEEN THE TWO READINGS ARE STILL OUT OF TOLERANCE, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

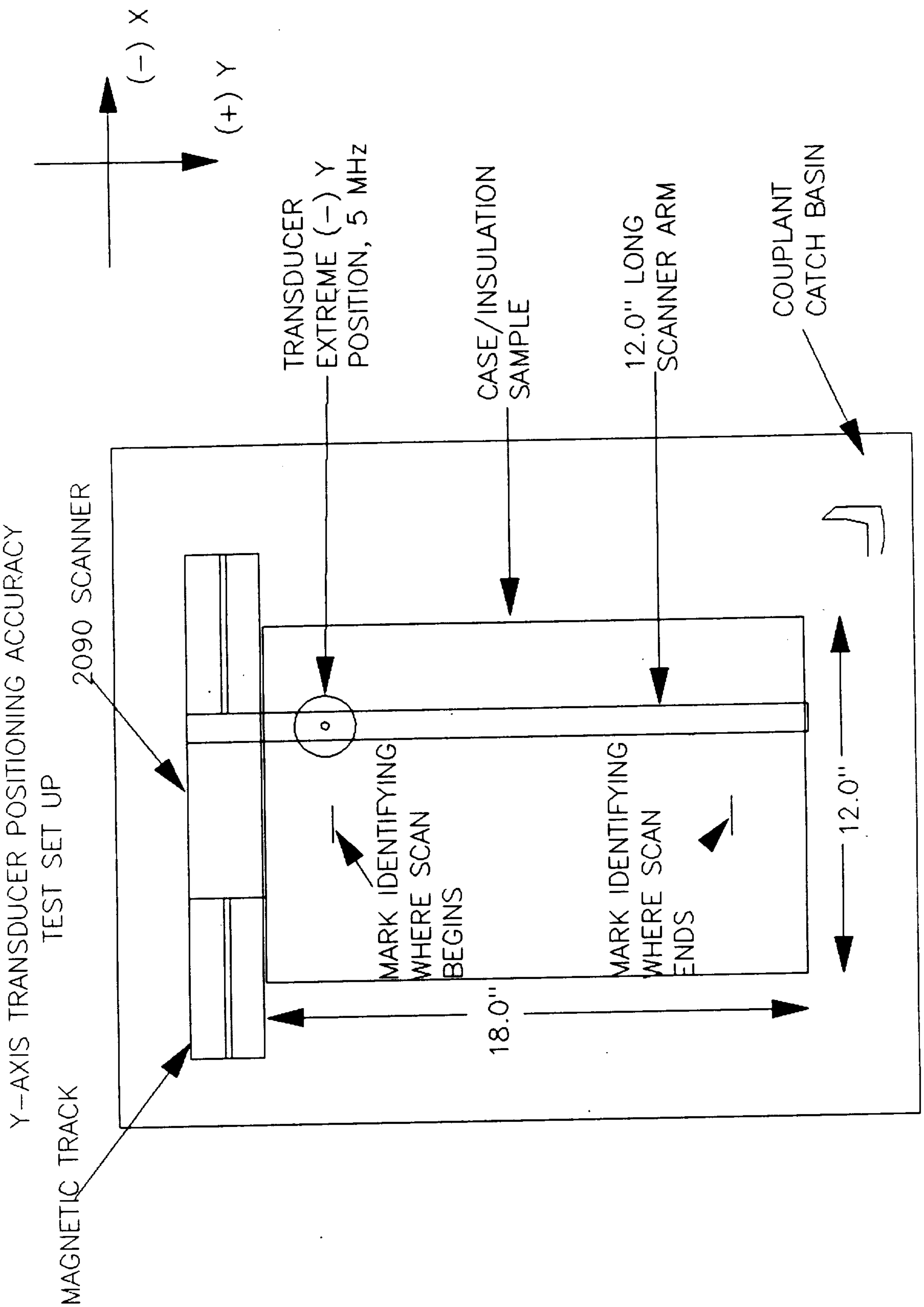
Y-AXIS TRANSDUCER POSITIONING ACCURACY
TEST SET UP
(-) X
(+) Y
TRANSDUCER
EXTREME (-) Y
POSITION, 5 MHz
CASE/INSULATION
SAMPLE
12.0" LONG
SCANNER ARM
COUPLANT
CATCH BASIN
2090 SCANNER
MARK IDENTIFYING
WHERE SCAN
BEGINS
MARK IDENTIFYING
WHERE SCAN
ENDS
12.0"
18.0"
MAGNETIC TRACK

FIGURE 1

X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 2/7/89

OPERATOR: [illegible]

VERIFIED BY: [illegible]

SYSTEM SERIAL NUMBER: S-A51866

TRANSDUCER SERIAL NUMBER: TS-196

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	J.K.
b) 10.0 IN. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	J.K.
c) SAMPLING INCREMENT IS 0.10 INCHES	J.K.
d) SAMPLING RATE IS 20.0 MHz	J.K.
e) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	J.K.
f) ENCODERS HAVE BEEN ZEROED AT START LOCATION	J.K.
g) THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 INCHES IN THE +X DIRECTION ..	J.K.

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED X-AXIS POSITION	RECORDED X-AXIS POSITION	DELTA
RUN 1	16.0	15.97	0.03
RUN 2	16.0	16.03	0.03
RUN 3	16.0	16.08	0.08

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST. IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE MASTER FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED X-AXIS POSITION	ACTUAL X-AXIS POSITION	DELTA
RUN 1	____________	____________	____________
RUN 2	____________	____________	____________
RUN 3	____________	____________	____________

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL X-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST.

CORRECTIVE ACTION(S) ____
____
____
____
____
____

IF THE DIFFERENCE BETWEEN THE TWO READINGS FROM ANY ONE OF THE THREE RUNS IS STILL OUT OF TOLERANCE COMPLETE A PROBLEM/ FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

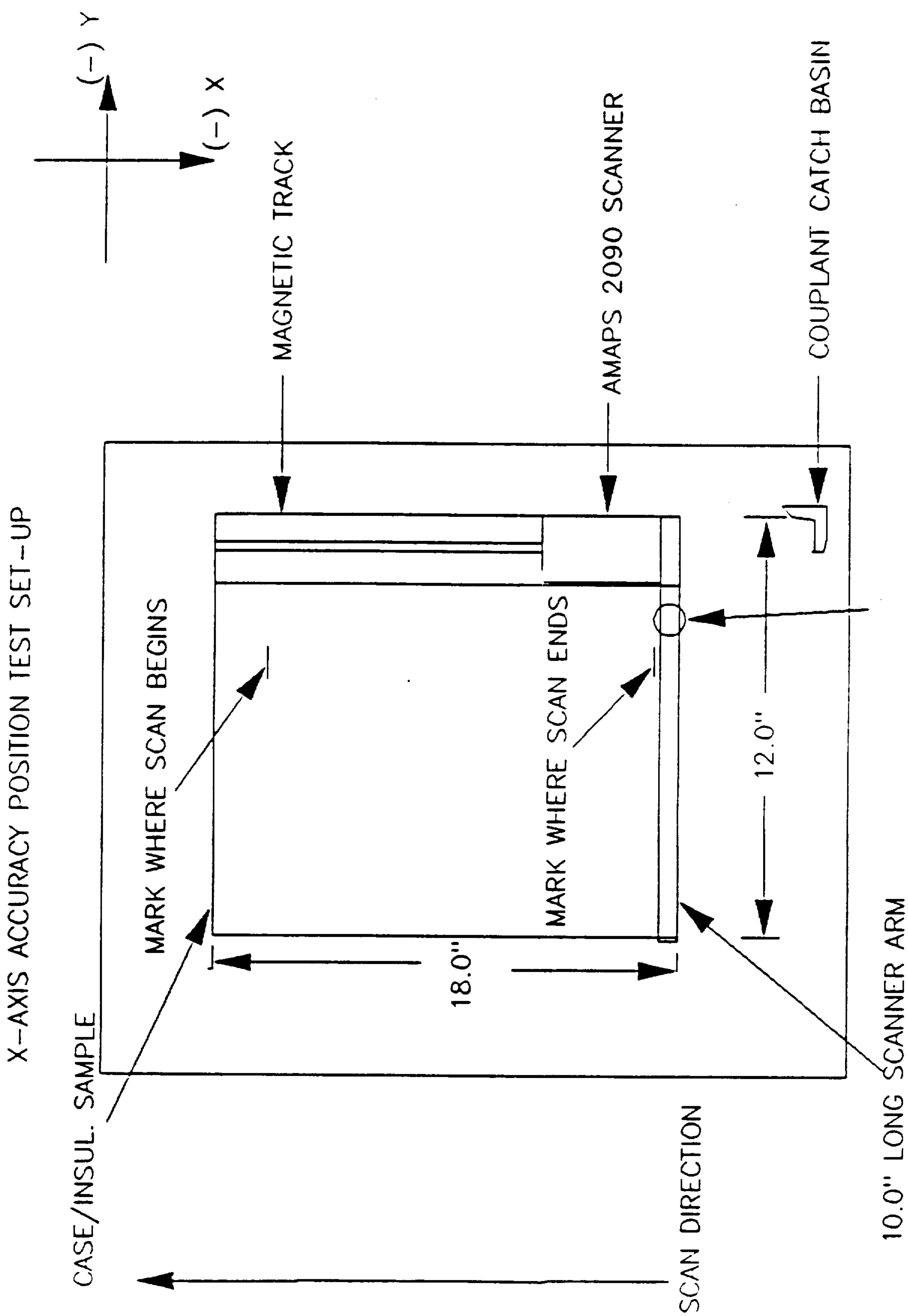
X-AXIS ACCURACY POSITION TEST SET-UP
(-) Y
(-) X
MAGNETIC TRACK
AMAPS 2090 SCANNER
COUPLANT CATCH BASIN
MARK WHERE SCAN BEGINS
MARK WHERE SCAN ENDS
12.0"
18.0"
CASE/INSUL. SAMPLE
SCAN DIRECTION
10.0" LONG SCANNER ARM

FIGURE 1

X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 21 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: P. Kauer.

SYSTEM SERIAL NUMBER: SA-51868

TRANSDUCER SERIAL NUMBER: T8353

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	BSC
c)	SAMPLING INCREMENT IS 0.10 INCHES	BSC
d)	SAMPLING RATE IS 20.0 MHz	BSC
e)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
f)	ENCODERS HAVE BEEN ZEROED AT START LOCATION	BSC
g)	THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 INCHES IN THE +X DIRECTION ..	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED X-AXIS POSITION	RECORDED X-AXIS POSITION	DELTA
RUN 1	16.0	16.1	.1
RUN 2	16.0	16.1	.1
RUN 3	16.0	16.1	.1

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST. IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE MASTER FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED X-AXIS POSITION	ACTUAL X-AXIS POSITION	DELTA
RUN 1	____________	____________	____________
RUN 2	____________	____________	____________
RUN 3	____________	____________	____________

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL X-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________
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IF THE DIFFERENCE BETWEEN THE TWO READINGS FROM ANY ONE OF THE THREE RUNS IS STILL OUT OF TOLERANCE COMPLETE A PROBLEM/ FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 9 March 89

OPERATOR: Brad Cushing

VERIFIED BY:

SYSTEM SERIAL NUMBER: SA51865

TRANSDUCER SERIAL NUMBER: RD-3

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	BSC
c)	SAMPLING INCREMENT IS 0.10 INCHES	BSC
d)	SAMPLING RATE IS 20.0 MHz	BSC
e)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
f)	ENCODERS HAVE BEEN ZEROED AT START LOCATION	BSC
g)	THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 INCHES IN THE +X DIRECTION ..	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED X-AXIS POSITION	RECORDED X-AXIS POSITION	DELTA
RUN 1	16"	16"	None
RUN 2	16"	16"	None
RUN 3	16"	16"	None

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST. IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE MASTER FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED X-AXIS POSITION	ACTUAL X-AXIS POSITION	DELTA
RUN 1	______	______	______
RUN 2	______	______	______
RUN 3	______	______	______

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL X-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE BETWEEN THE TWO READINGS FROM ANY ONE OF THE THREE RUNS IS STILL OUT OF TOLERANCE COMPLETE A PROBLEM/ FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

X-AXIS ACCURACY POSITION TEST SET-UP

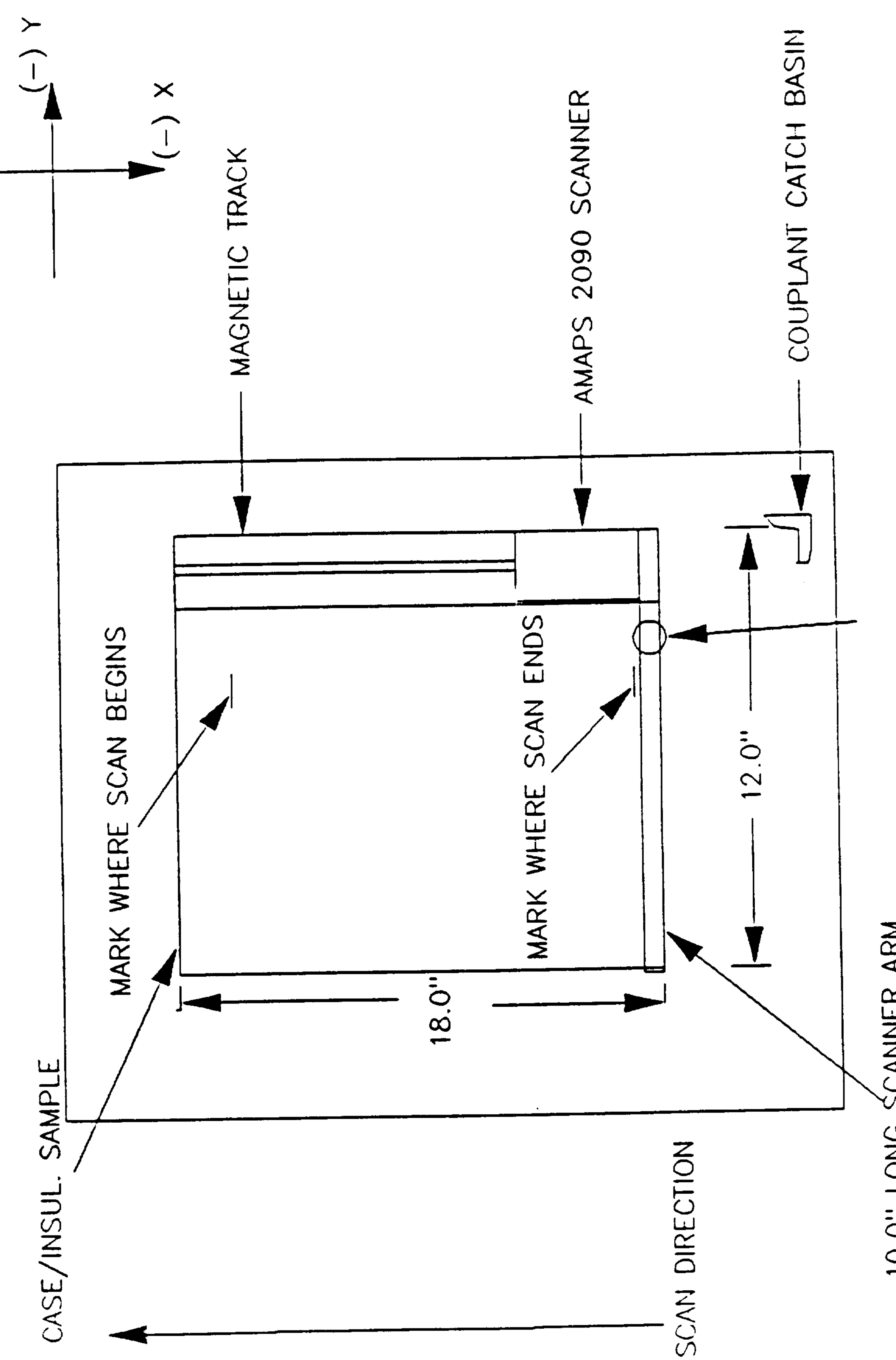

FIGURE 1

X-AXIS TRANSDUCER POSITIONING ACCURACY VERIFICATION TEST

DATE: 18 May 89

OPERATOR: B. Cushing

VERIFIED BY: [illegible] 5/18/89

SYSTEM SERIAL NUMBER: SA51869

TRANSDUCER SERIAL NUMBER: RND-3

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST SEQUENCE.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS CONNECTED TO AMAPS 2090 SCANNER	BSC
c) SAMPLING INCREMENT IS 0.10 INCHES	BSC
d) SAMPLING RATE IS 20.0 MHz	BSC
e) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
f) ENCODERS HAVE BEEN ZEROED AT START LOCATION	BSC
g) THE AMAPS 2090 SCANNER HAS BEEN PROGRAMED TO MOVE 16.0 INCHES IN THE +X DIRECTION ..	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	INDICATED X-AXIS POSITION	RECORDED X-AXIS POSITION	DELTA
RUN 1	16.0	16.0	0
RUN 2	16.0	16.0	0
RUN 3	16.0	16.0	0

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL VALUES WERE WITHIN 0.1 INCH, PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST. IF ANY OF THE RUNS FAILED, RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO THE MASTER FORM, RE-PERFORM TEST. RECORD RESULTS BELOW.

	INDICATED X-AXIS POSITION	ACTUAL X-AXIS POSITION	DELTA
RUN 1	________	________	________
RUN 2	________	________	________
RUN 3	________	________	________

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL X-AXIS POSITIONS ARE WITHIN 0.1 INCH, RECORD IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. PROCEED TO Y-AXIS SCAN VELOCITY VERIFICATION TEST.

CORRECTIVE ACTION(S) ____

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IF THE DIFFERENCE BETWEEN THE TWO READINGS FROM ANY ONE OF THE THREE RUNS IS STILL OUT OF TOLERANCE COMPLETE A PROBLEM/ FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE SPECIFIC INFORMATION CONCERNING THIS PROBLEM.

X-AXIS ACCURACY POSITION TEST SET-UP

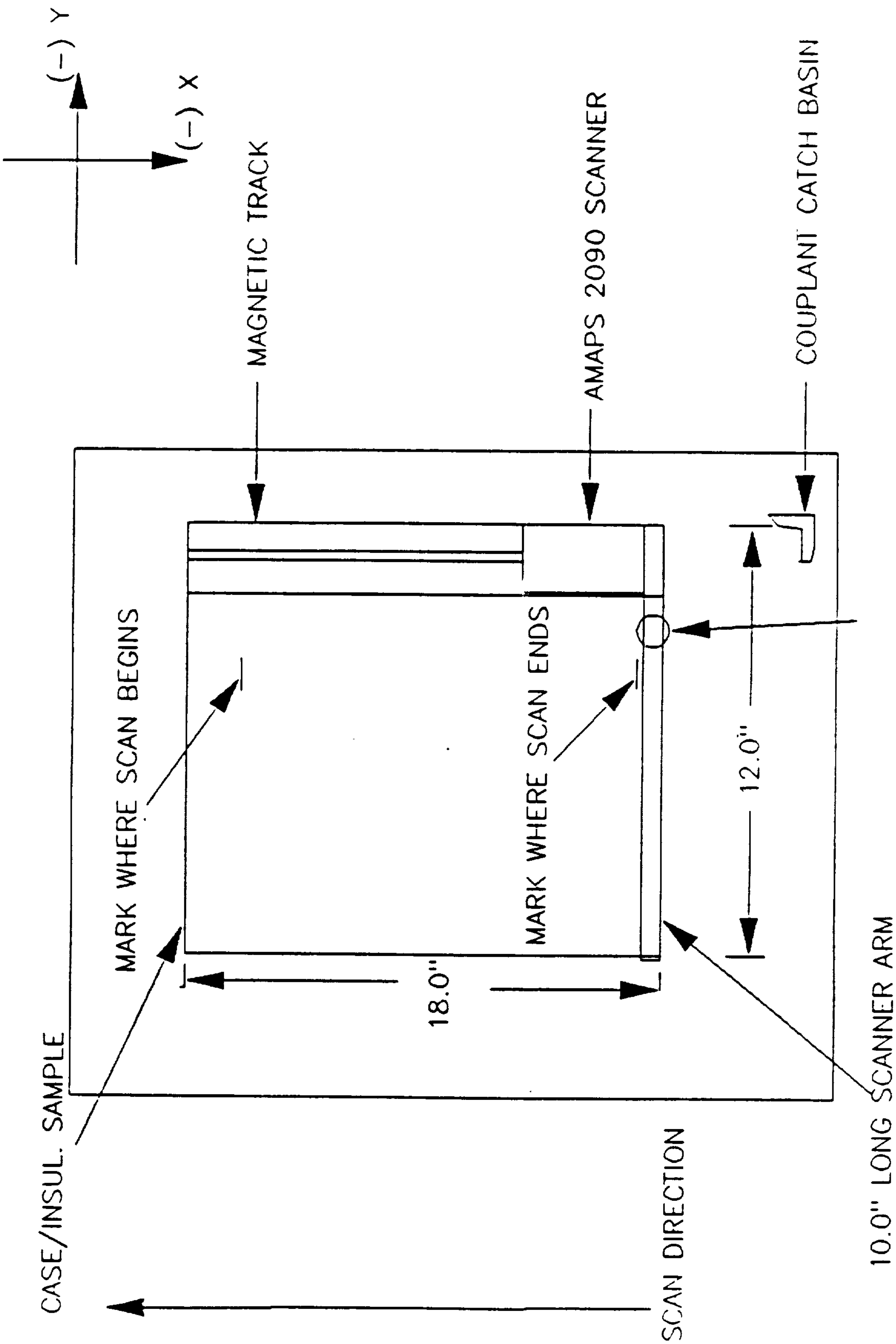

FIGURE 1

Y-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 16 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: ? Kainer

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51866

TRANSDUCER SERIAL NUMBER: T5359

STOP WATCH MANUFACTURER: Citizen

PART 1. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	
b) 12.0 IN. LONG SCANNER ARM IS BEING USED	
c) SAMPLING INCREMENT IS 0.10 IN.	
d) Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	
e) A/D SAMPLING RATE IS AT 20.0 MHz	
f) SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	
g) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	
h) PRINTER IS CONFIGURED PROPERLY	

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 10.0 IN./TIME)
RUN 1	~~3.13~~ 3.19 sec	3.13 in/sec
RUN 2	3.14 sec	3.18 in/sec
RUN 3	3.13 sec	3.19 in/sec

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(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

   IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	________	________________
RUN 2	________	________________
RUN 3	________	________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

   CORRECTIVE ACTION(S) ______________________________
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   IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. Y-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 10.0 IN./TIME)
RUN 1	4.47 sec	2.2 in/sec
RUN 2	4.44 sec	2.2 in/sec
RUN 3	4.42 sec	2.2 in/sec

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	~~12.0~~ 10.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 39.95 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 1 pulse width 1.95 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	3.1 sec	3.2 in/sec unable to complete scan
RUN 2	3.17 sec	3.1 in/sec due to expected waves
RUN 3	3.16 sec	3.1 in/sec exceeded recieved waves.

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	______	______________
RUN 2	______	______________
RUN 3	______	______________

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) ____

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IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. Y-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
(a)	Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b)	REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	4.43 sec	2.25 in/sec
RUN 2	4.42 sec	2.26 in/sec
RUN 3	4.47 sec	2.23 in/sec

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	______________	____________________________
RUN 2	______________	____________________________
RUN 3	______________	____________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ____
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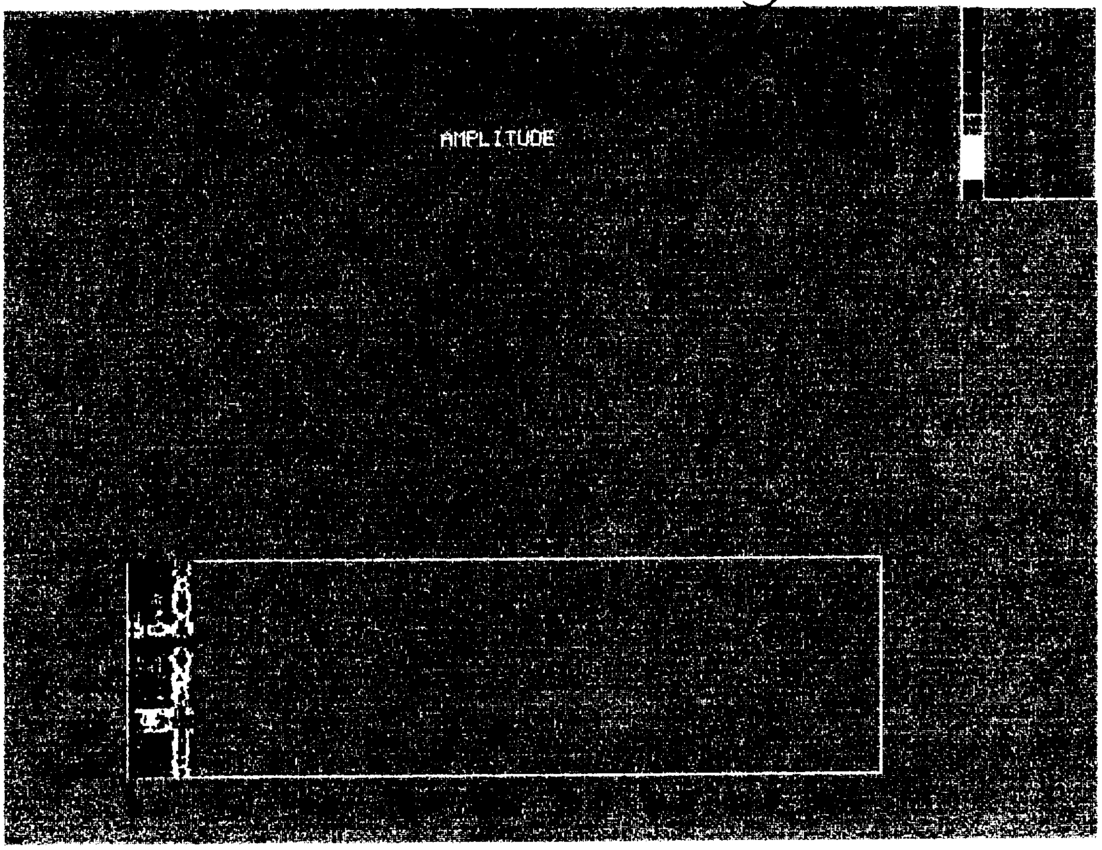
IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

Peak 2.5 ips

y-Axis Scan Velocity



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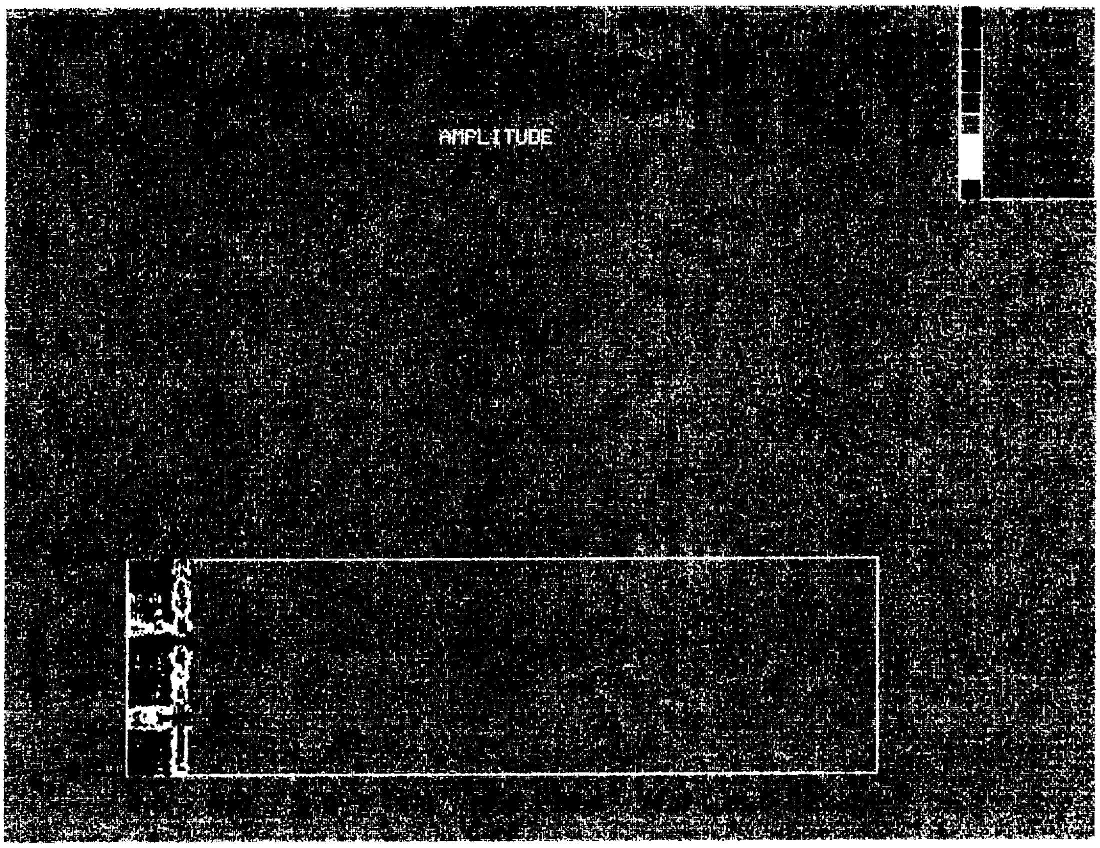
Peak 4.0 ips

Y-Axis Scan Velocity



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R.F. 4.0 ips Unable to complete scan

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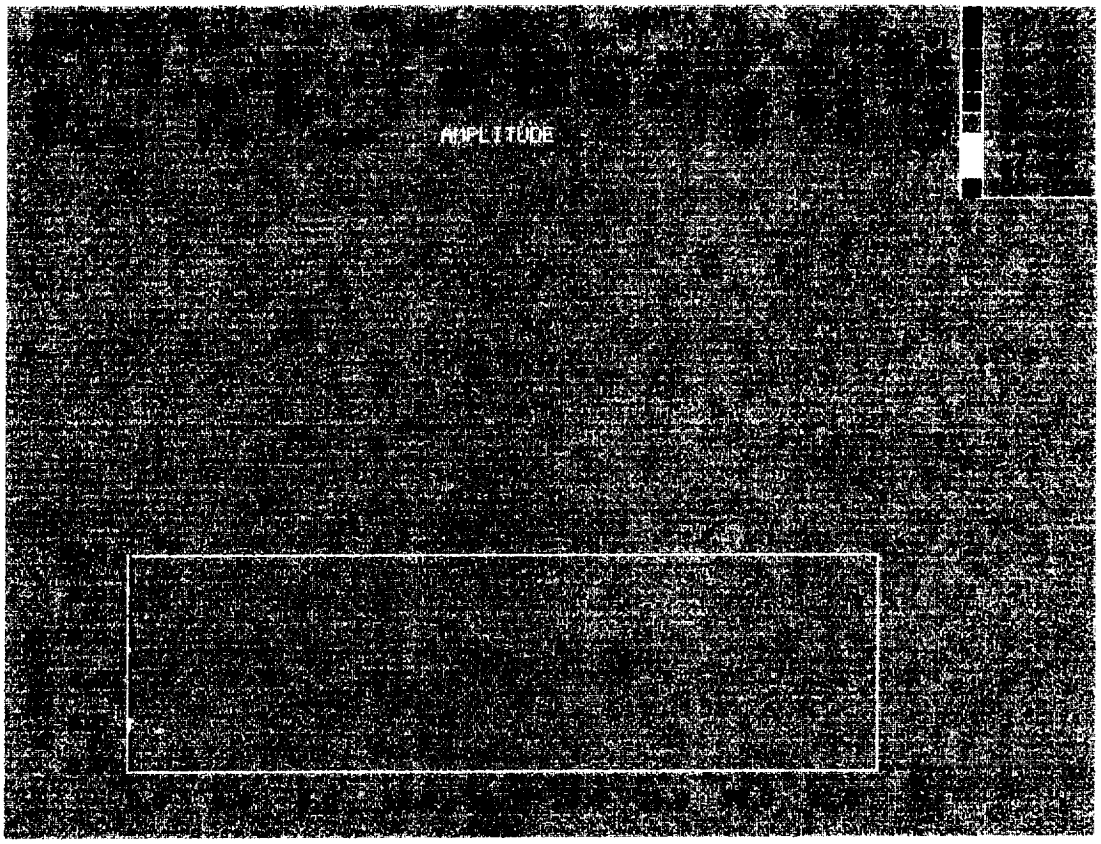
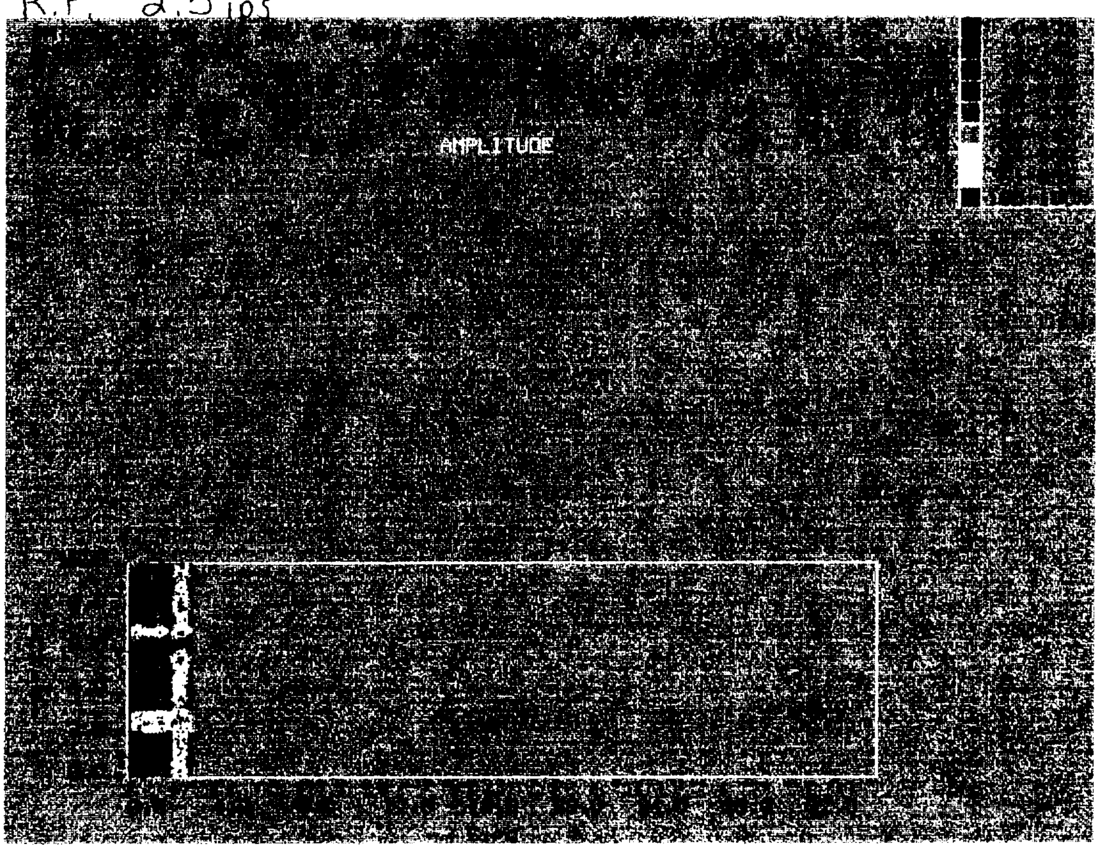
Y-Axis Scan Velocity



R.F. 2.5 ips



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Y-AXIS SCAN VELOCITY TEST SET UP

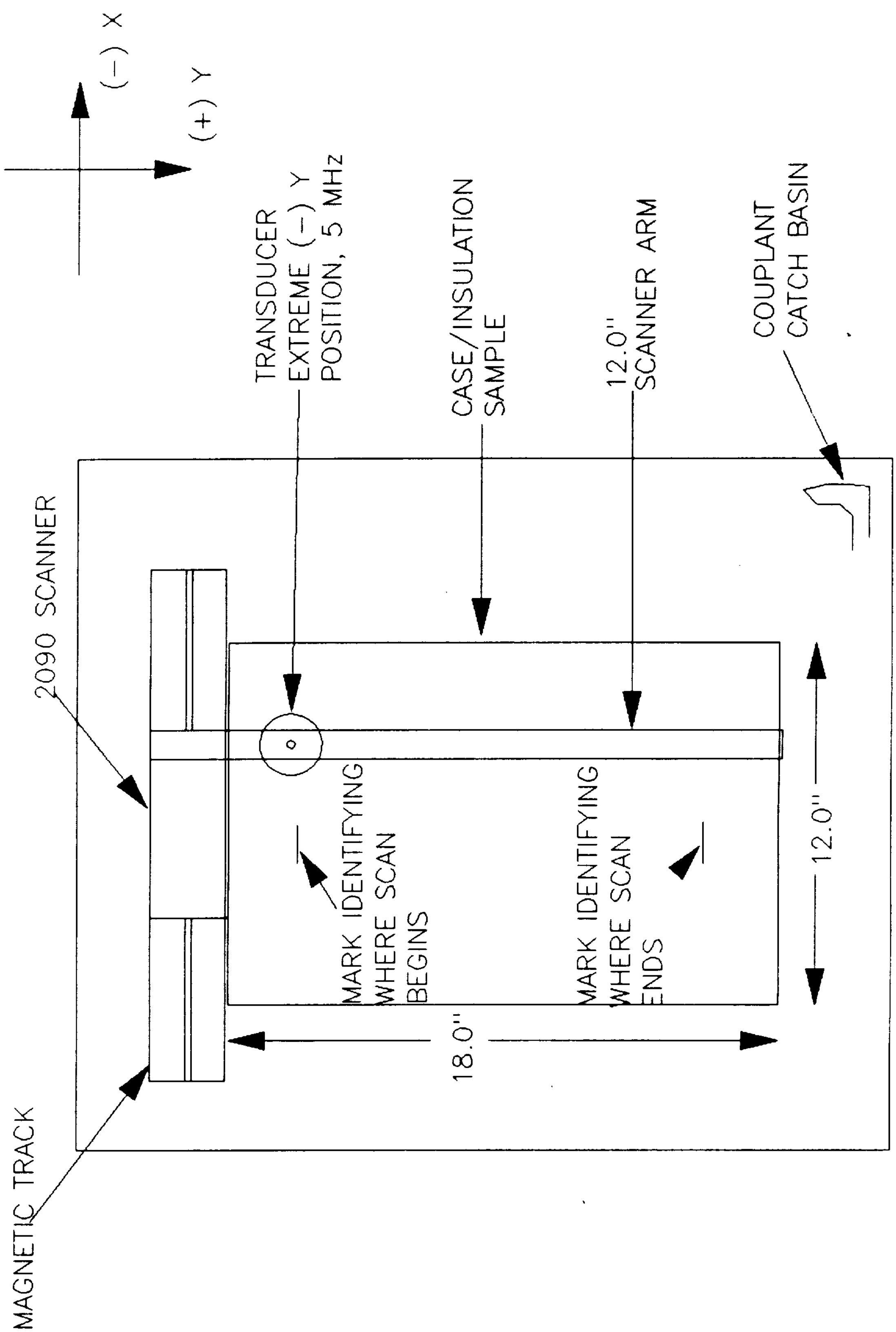

FIGURE 1

Y-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 21 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: J. Kaner

SOFTWARE VERSION NUMBER: 4.C

SYSTEM SERIAL NUMBER: SA 51868

TRANSDUCER SERIAL NUMBER: T8353

STOP WATCH MANUFACTURER: Citizen

PART 1. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	12.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h)	PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12~~ 10.0 IN./TIME)
RUN 1	3.2	3.12 in/sec
RUN 2	3.2	3.12 in/sec
RUN 3	3.1	3.15 in/sec

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

   IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	____________	______________________
RUN 2	____________	______________________
RUN 3	____________	______________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

   CORRECTIVE ACTION(S) ____________________________________
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   ____

   IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. Y-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	4.5	2.2 in/sec
RUN 2	4.4	2.2 in/sec
RUN 3	4.5	2.2 in/sec

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	~~4.5~~	
RUN 2	~~4.~~	
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	12.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 22.9 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 1.5 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12~~ 10.0 IN./TIME)
RUN 1	3.2	3.1
RUN 2	3.2	3.1
RUN 3	3.3	3.0

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) ____________________

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IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. Y-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
(a) Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b) REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 10.0 IN./TIME)
RUN 1	4.6	2.1
RUN 2	4.6	2.1
RUN 3	4.6	2.1

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ____________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	____________	________________________
RUN 2	____________	________________________
RUN 3	____________	________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ____
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IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

Y-Axis Scan Velocity

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COLOR PHOTOGRAPH

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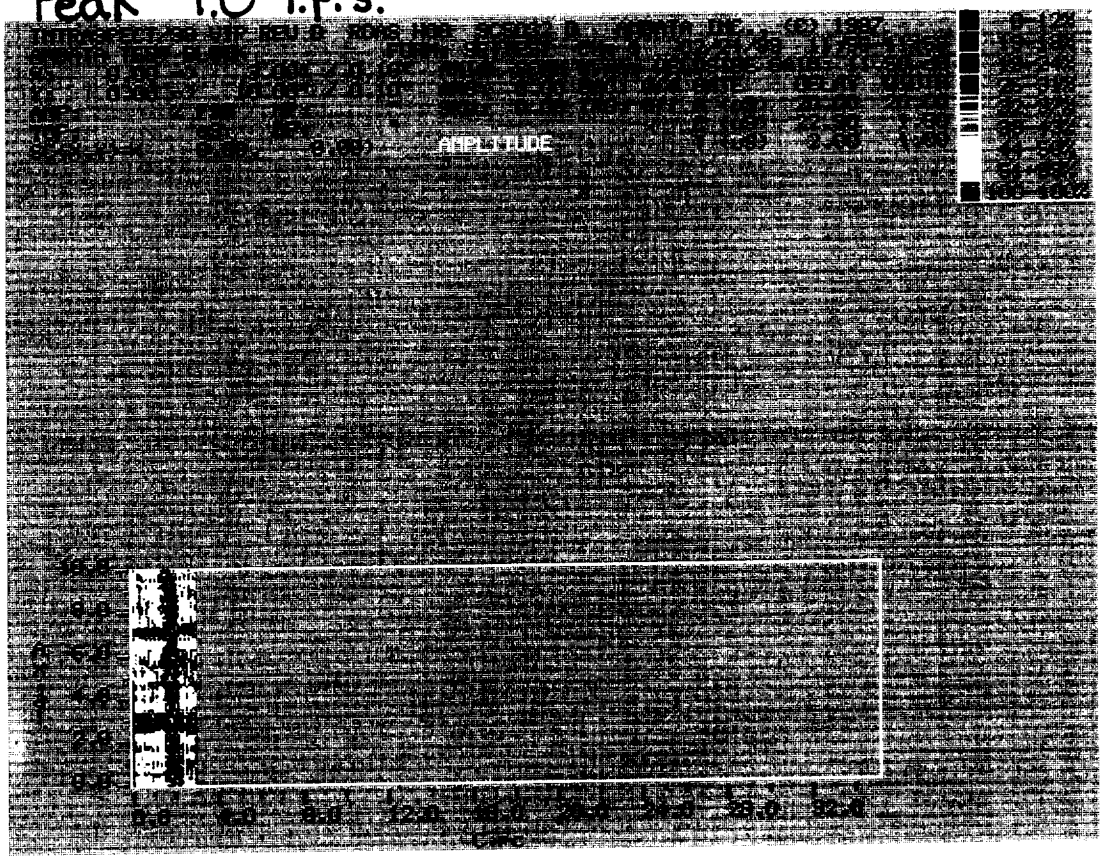
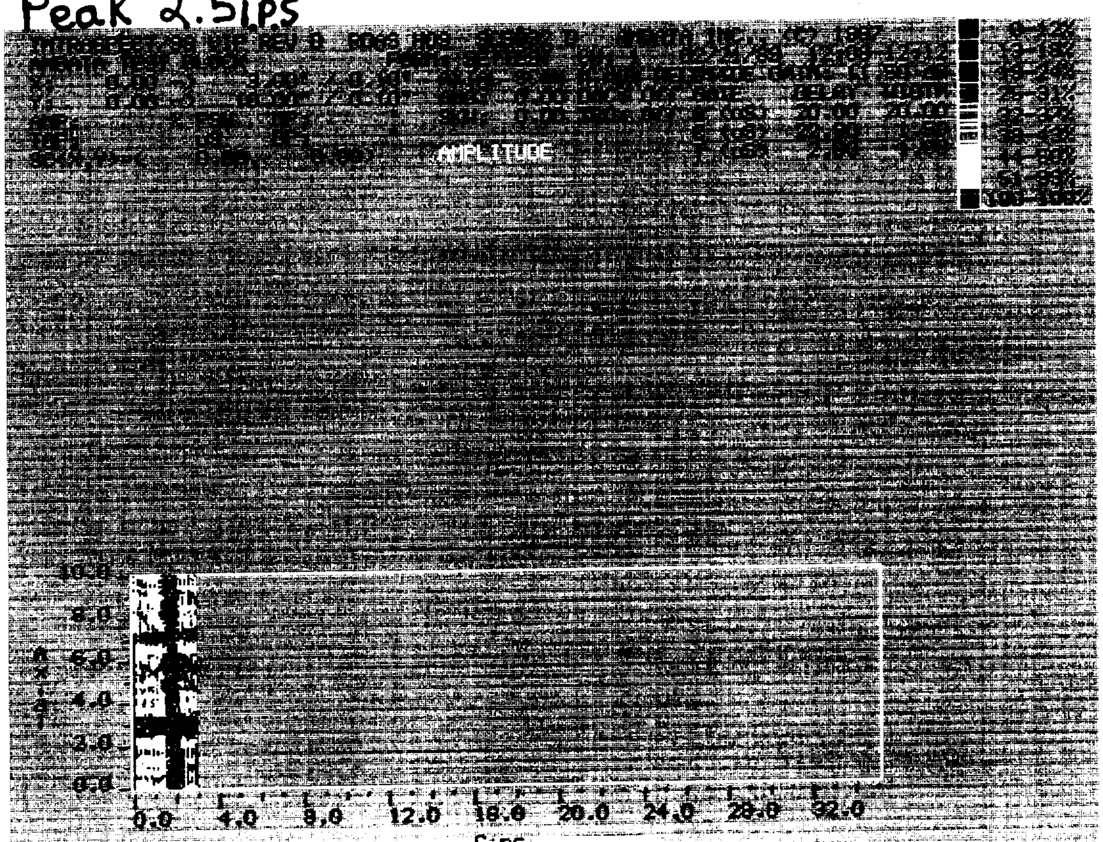
Peak 4.0 I.P.S.



Peak 2.5 IPS



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Y-Axis Scan Velocity

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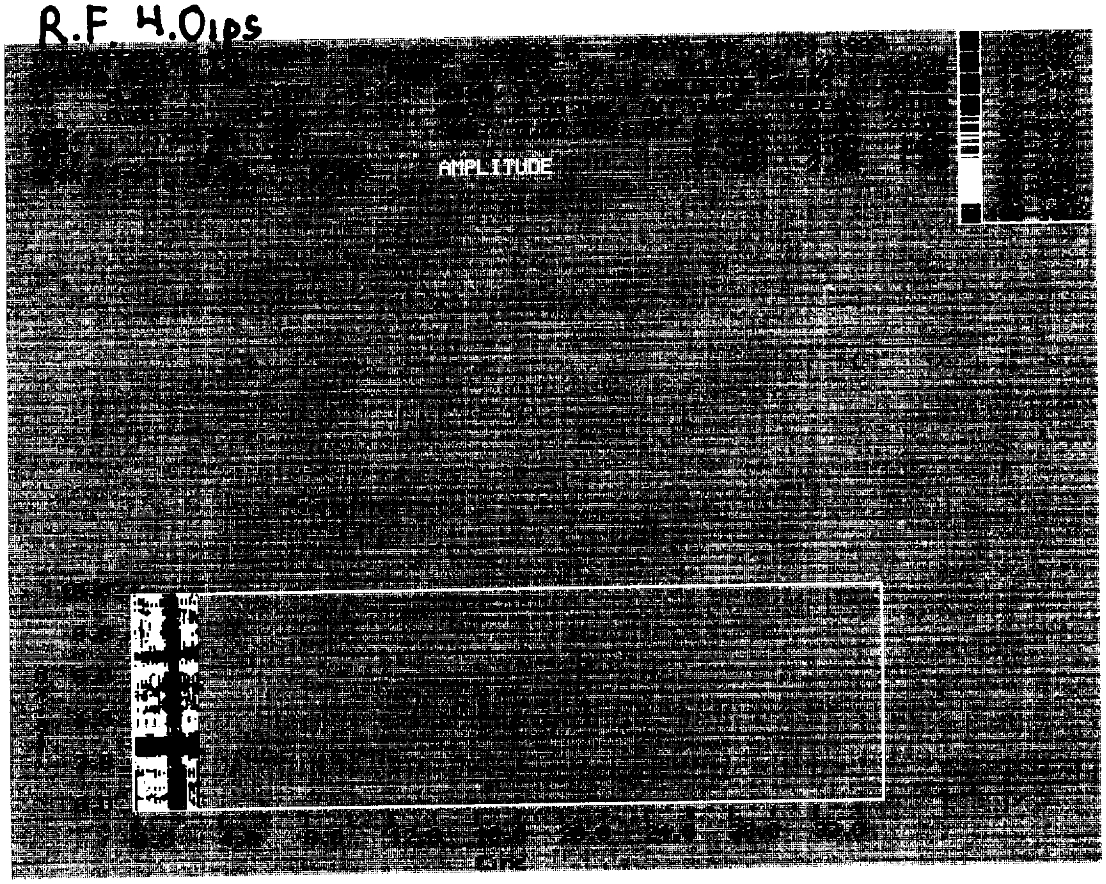
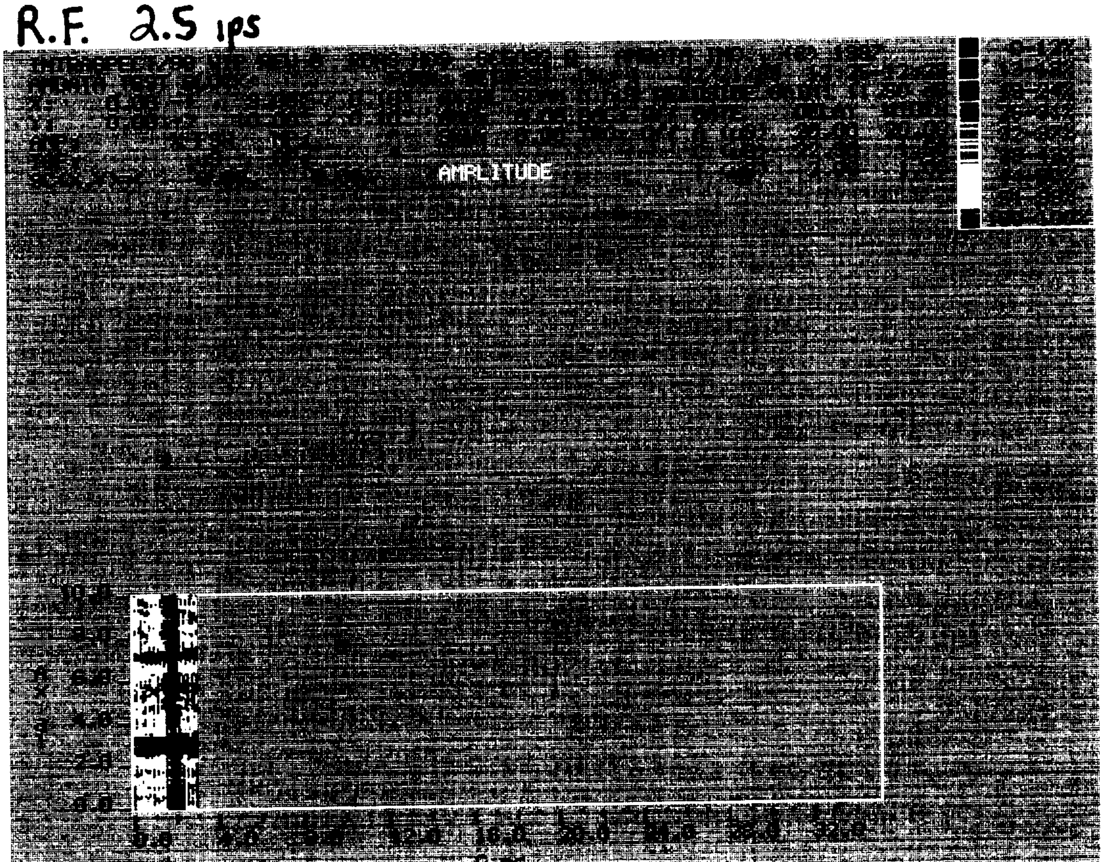
COLOR PHOTOGRAPH

R.F. 4.0 ips



R.F. 2.5 ips



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Y-AXIS SCAN VELOCITY TEST SET UP

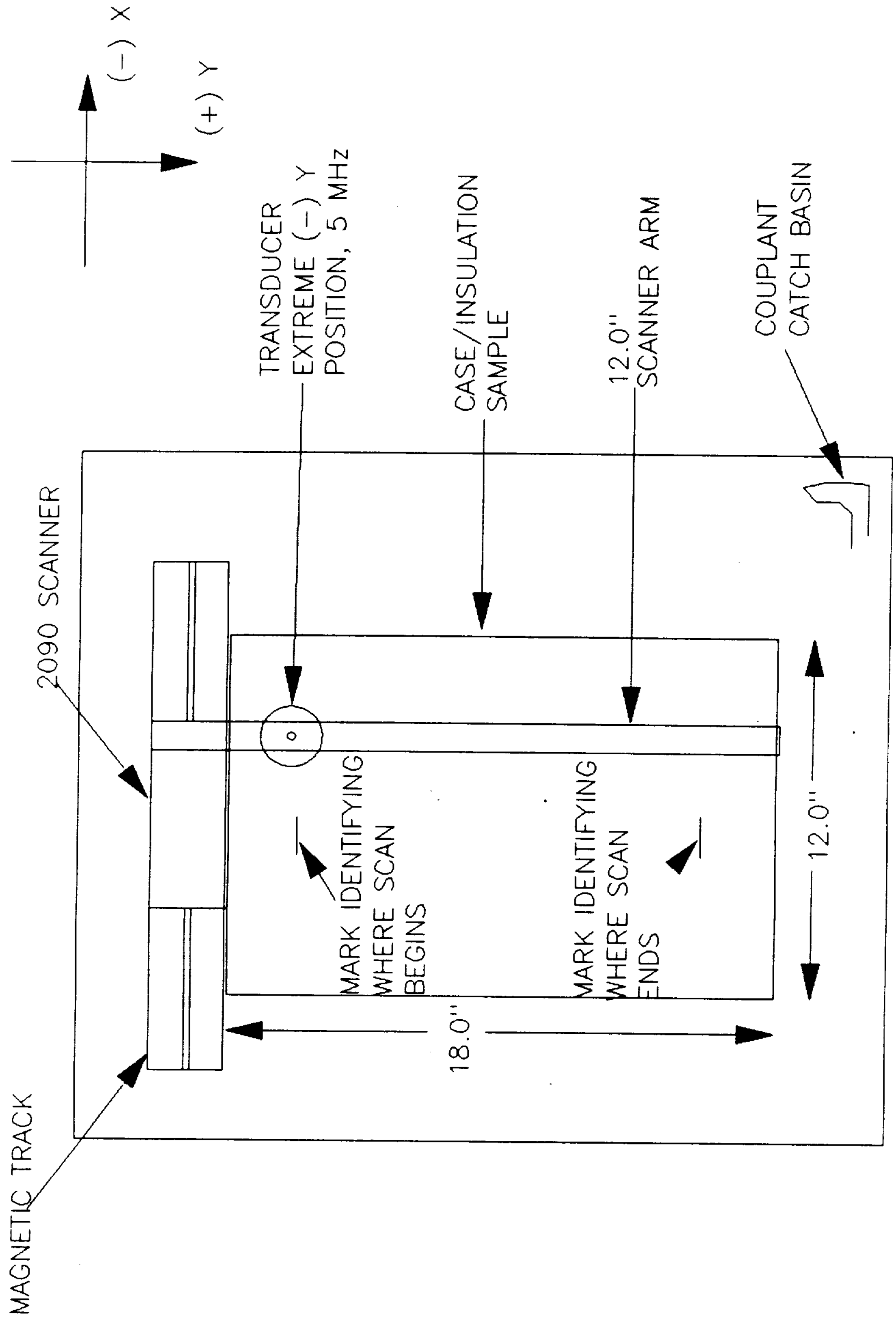

FIGURE 1

Y-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 9 March 89

OPERATOR: Brad Cushing

VERIFIED BY:

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51865

TRANSDUCER SERIAL NUMBER: RD-3

STOP WATCH MANUFACTURER: Citizen

PART 1. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) ~~12.0~~ 10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e) A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f) SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h) PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 10.0 IN./TIME)
RUN 1	3.3	3.0 in/sec
RUN 2	3.1	3.2 in/sec
RUN 3	3.3	3.0 in/sec

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	____________	______________________
RUN 2	____________	______________________
RUN 3	____________	______________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

CORRECTIVE ACTION(S) ____________________________________
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IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. Y-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.~~ 10.0 IN./TIME)
RUN 1	4.5	2.2 in/sec
RUN 2	4.5	2.2 in/sec
RUN 3	4.6	2.1 in/sec

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	~~12.0~~ 10.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 13.5 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 2.35 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 10 IN./TIME)
RUN 1	3.1	3.2
RUN 2	3.1	3.2
RUN 3	3.0	3.3

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. Y-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
(a)	Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b)	REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 10.0 IN./TIME)
RUN 1	4.4	2.2
RUN 2	4.4	2.2
RUN 3	4.4	2.2

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	________	________________
RUN 2	________	________________
RUN 3	________	________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ______________________________
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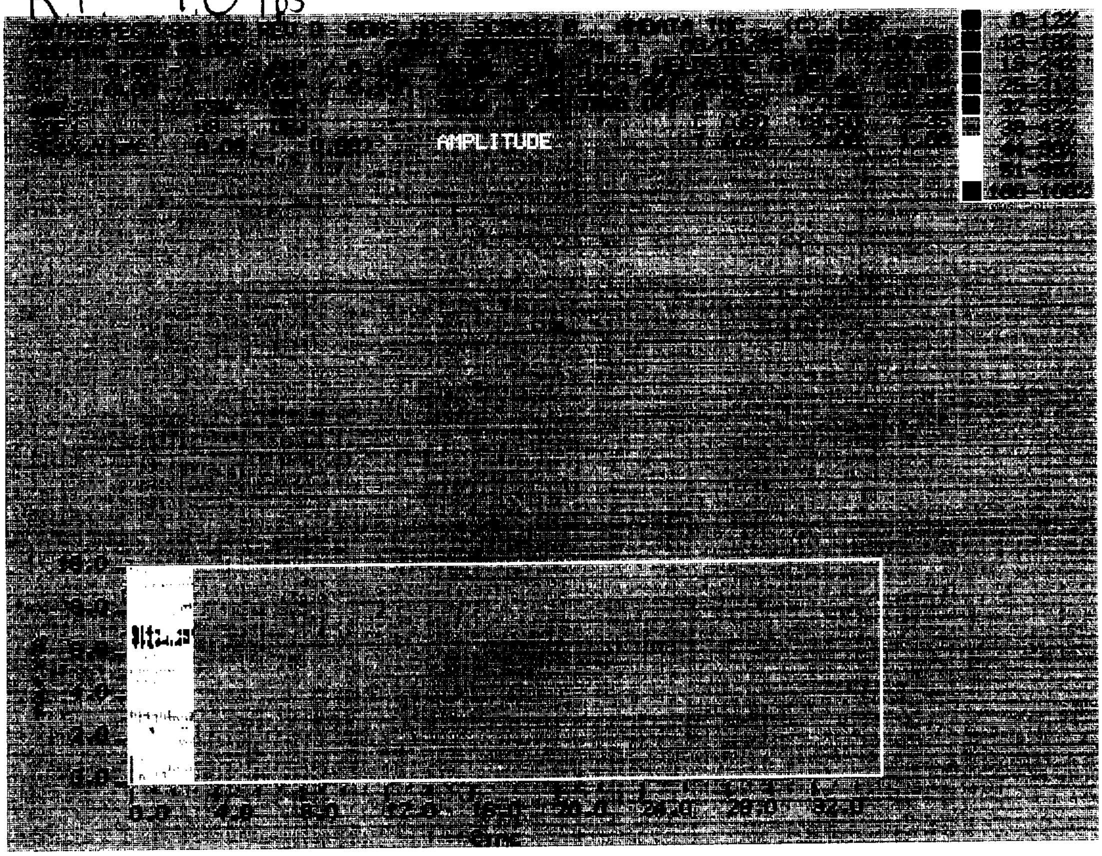
IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

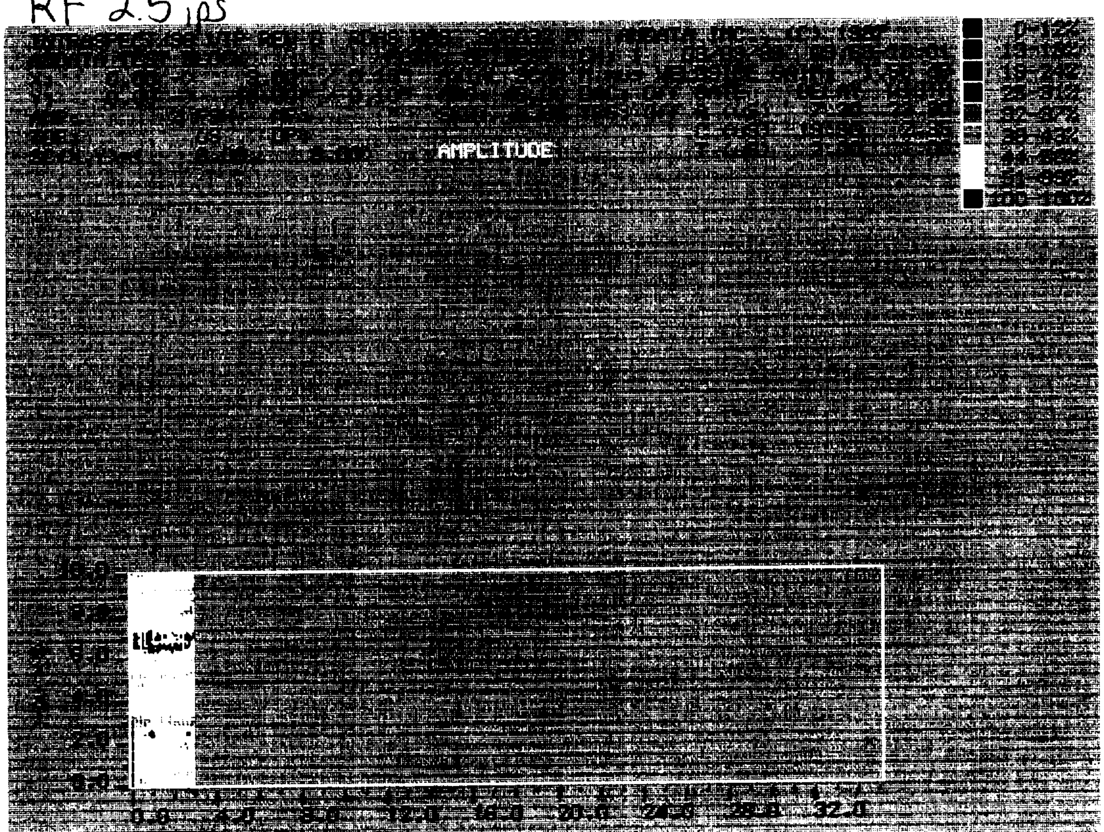
***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

y-Axis Scan Velocity

R.F. 4.0 ips



RF 2.5 ips



y-Axis Scan Velocity

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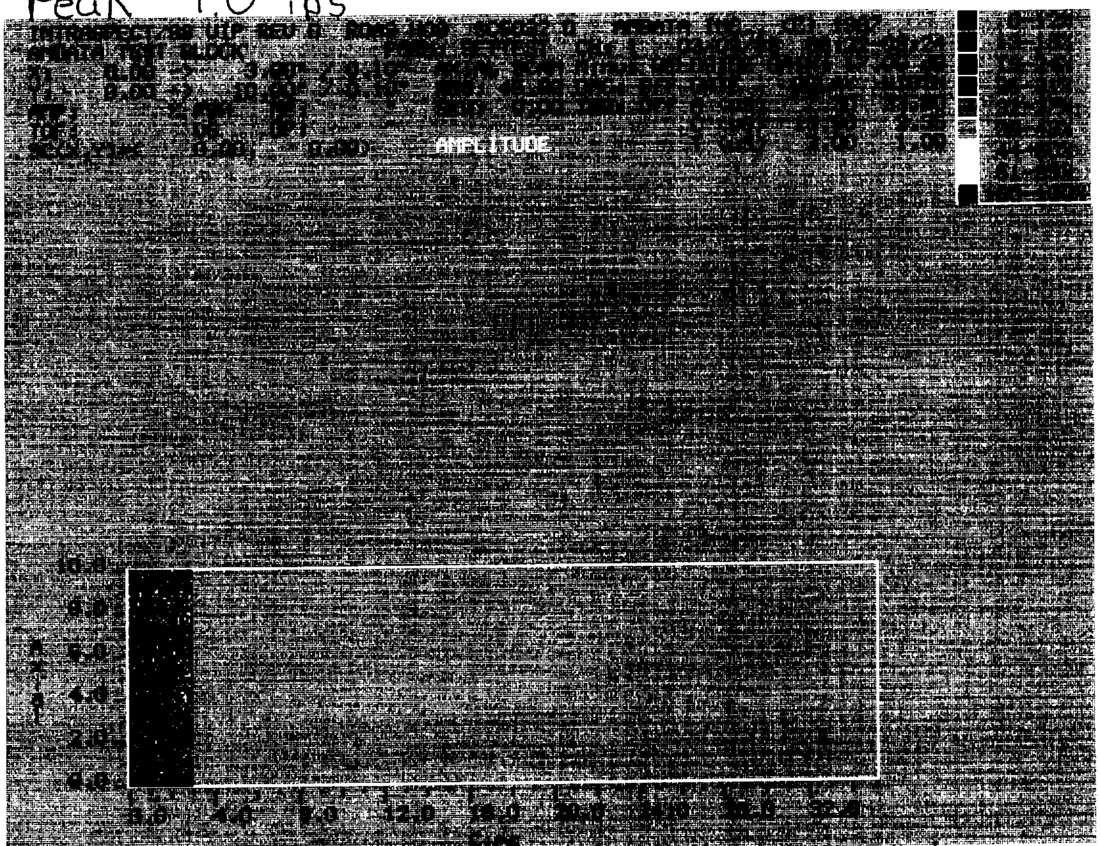
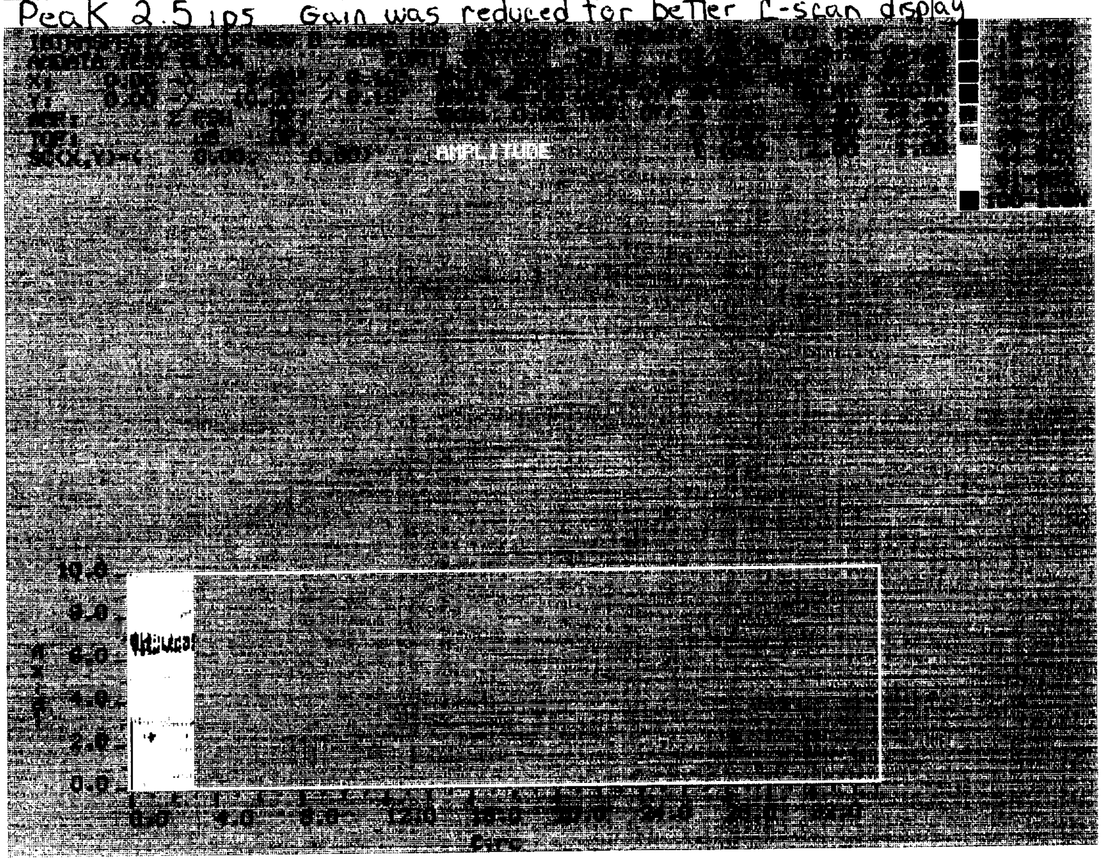
Peak 4.0 ips



Peak 2.5 ips Gain was reduced for better C-scan display



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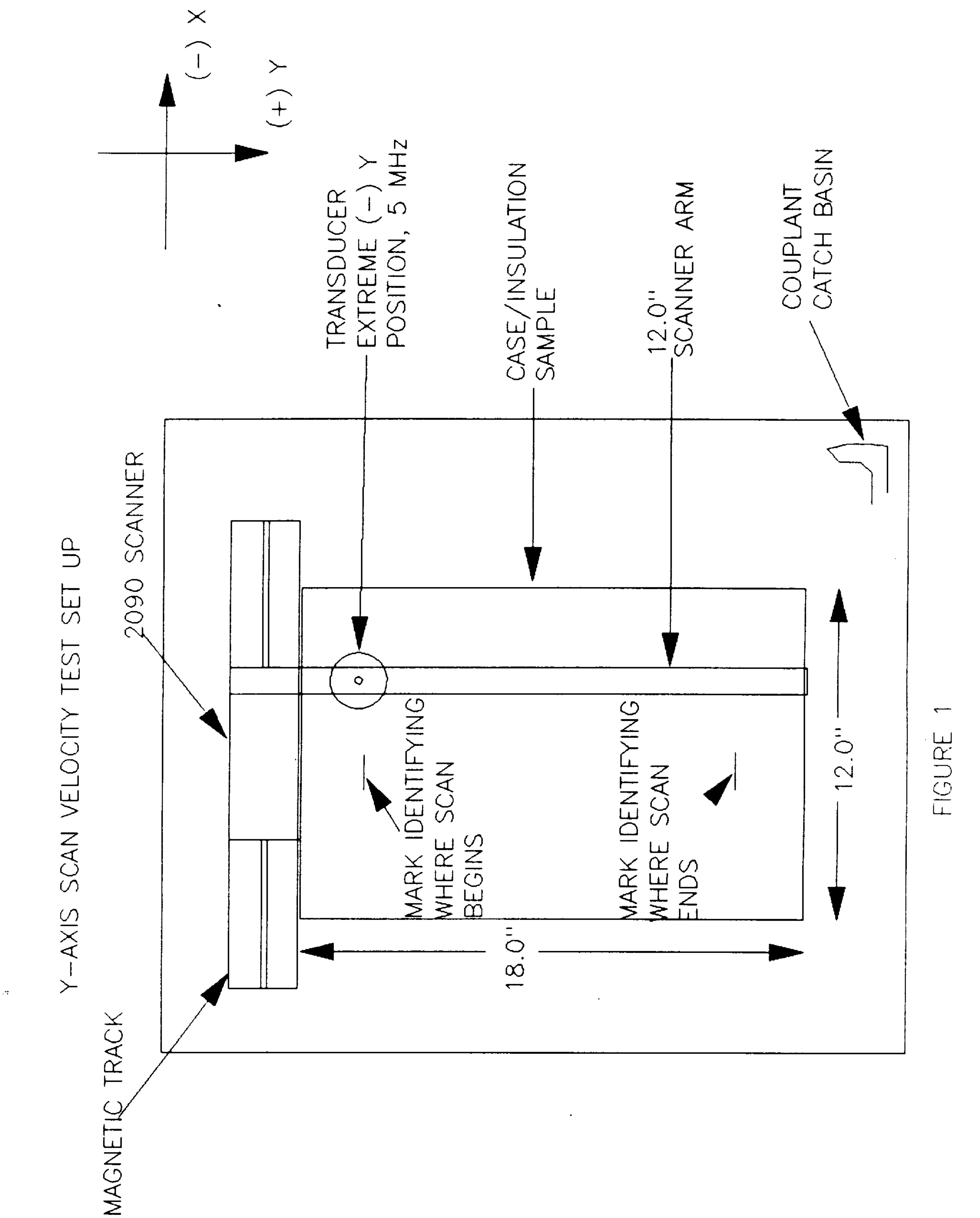

FIGURE 1

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Y-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: ~~18 May 89~~ 23 May 89

OPERATOR: B. Cushing

VERIFIED BY: [illegible]

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 515691

TRANSDUCER SERIAL NUMBER: BND-3

STOP WATCH MANUFACTURER: Citizen

PART 1. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	~~12.0~~ 16.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h)	PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ ~~16.0~~ 8.0" IN./TIME)
RUN 1	2.71	2.9 ips
RUN 2	2.67	2.9 ips
RUN 3	~~2.2~~ 2.65	2.9 ips

[redacted]

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	____________	____________________
RUN 2	____________	____________________
RUN 3	____________	____________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. Y-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 8.0 IN./TIME)
RUN 1	3.65	2.2 ips
RUN 2	3.66	2.2 ips
RUN 3	3.61	2.2 ips

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. Y-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE Y-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	~~12.0~~ 16.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	Y-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ ~~46.0~~ 47.25 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 4.9 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 8.0 IN./TIME)
RUN 1	2.52	3.1 ips unable to complete scan
RUN 2	2.64	3.0 ips " " " "
RUN 3	2.61	3.0 ips " " " "

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) ______________________________

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IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. Y-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
(a) Y-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b) REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~12.0~~ 8.0 IN./TIME)
RUN 1	4.39	2.2 ips
RUN 2	4.43	2.2 ips
RUN 3	4.45	2.2 ips

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (12.0 IN./TIME)
RUN 1	____________	________________________
RUN 2	____________	________________________
RUN 3	____________	________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE X-AXIS SCAN VELOCITY VERIFICATION TESTS.

CORRECTIVE ACTION(S) ____________________________________
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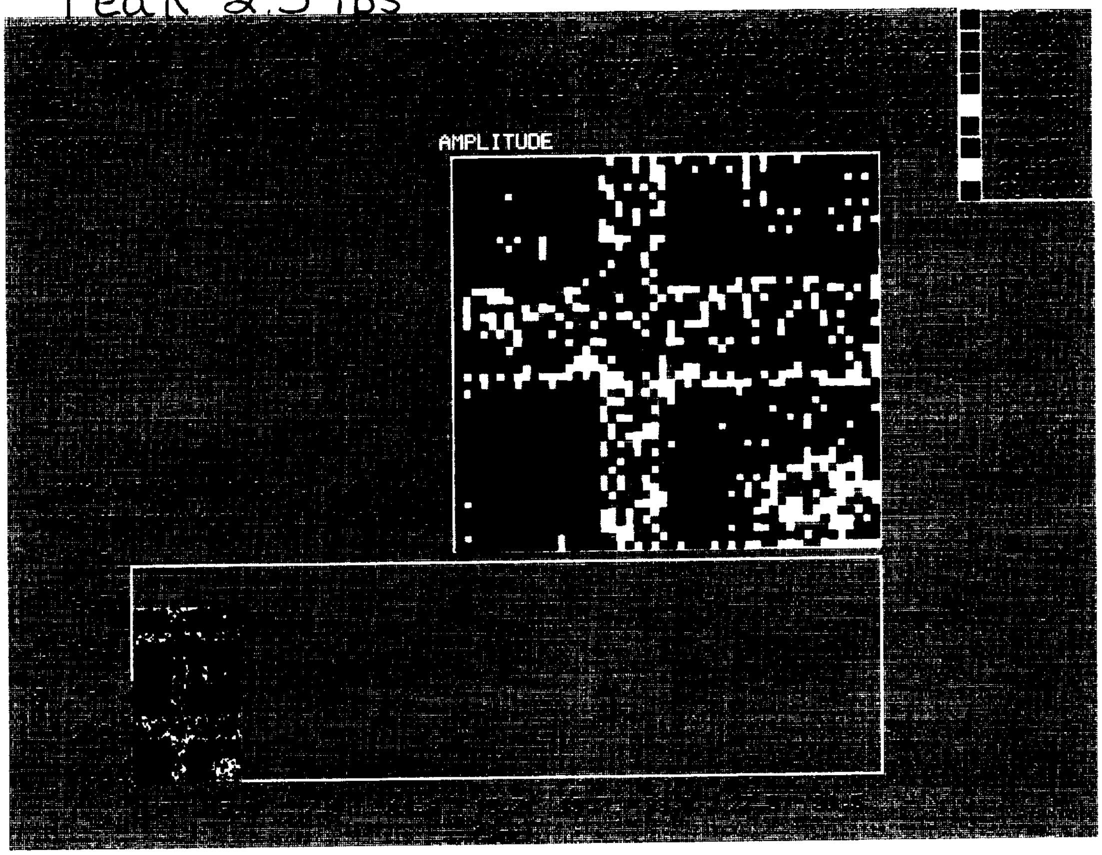
IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

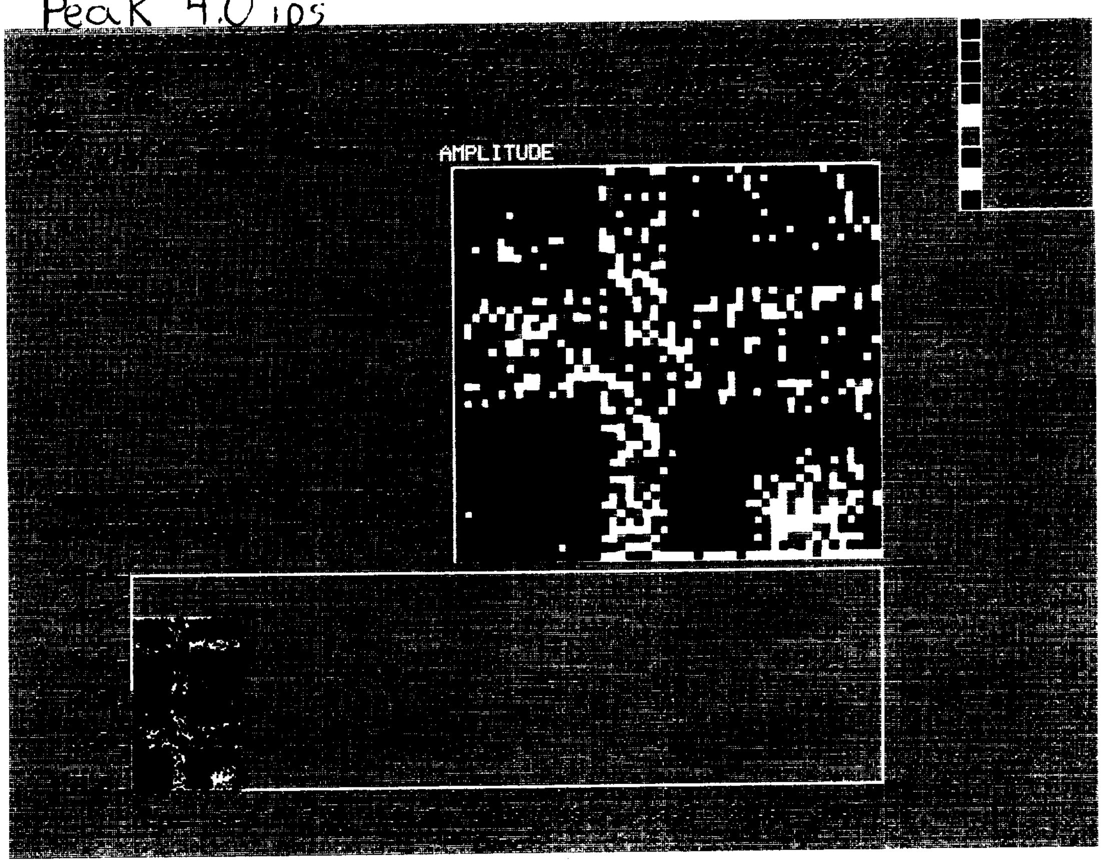
Y-Axis Scan Velocity

ORIGINAL PAGE
COLOR PHOTOGRAPH

Peak 2.5 ips



Peak 4.0 ips



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y-Axis Scan Velocities

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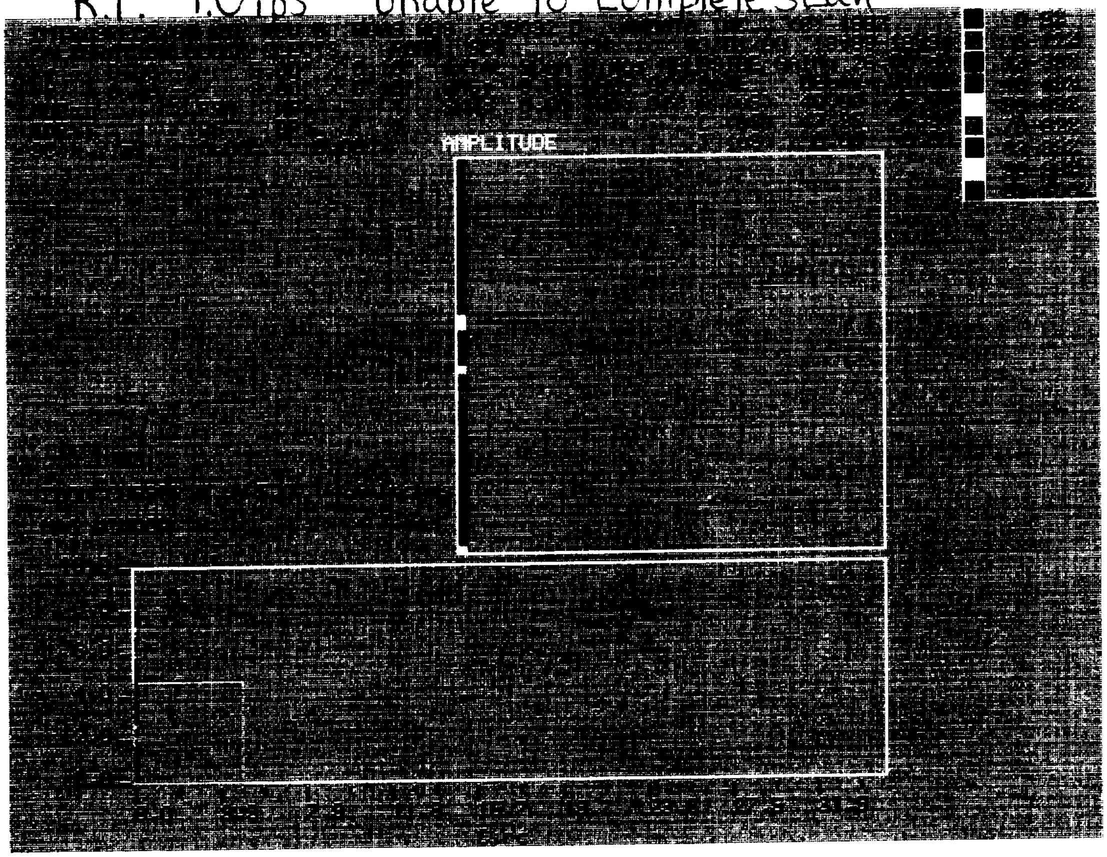
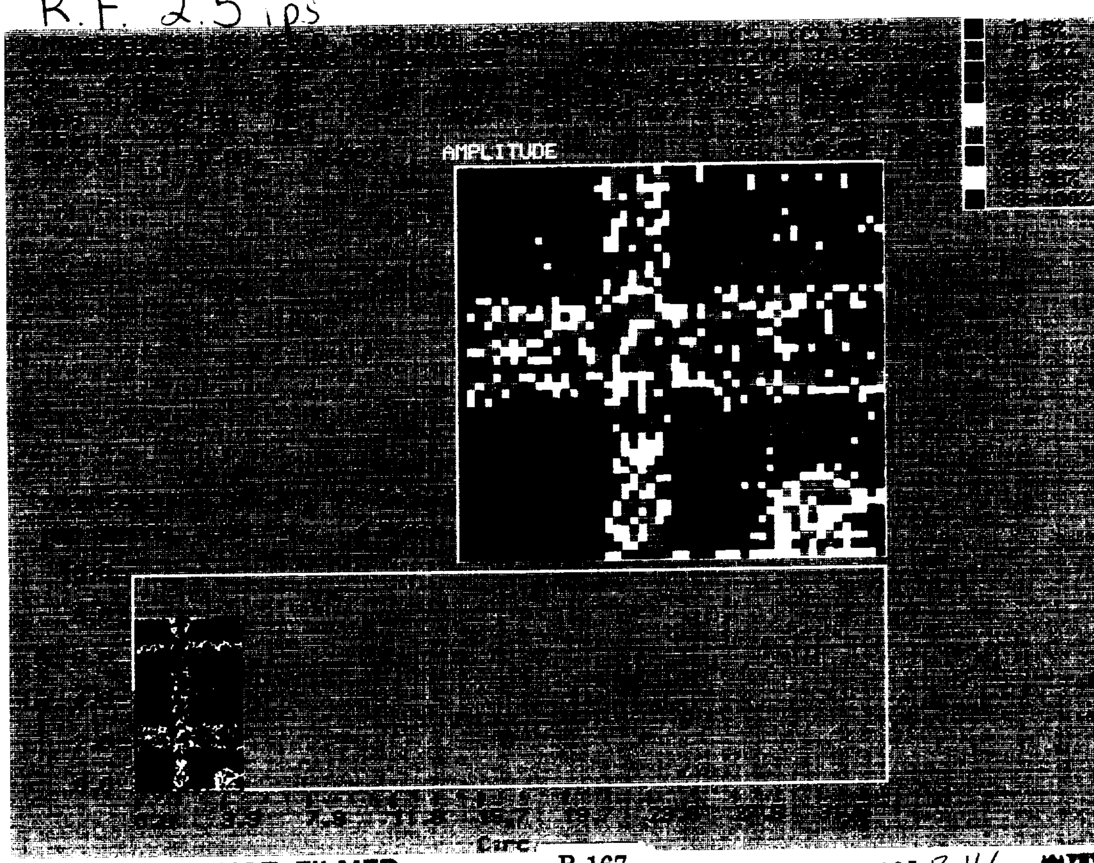
COLOR PHOTOGRAPH

R.F. 4.0 ips unable to complete scan



R.F. 2.5 ips



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Y-AXIS SCAN VELOCITY TEST SET UP

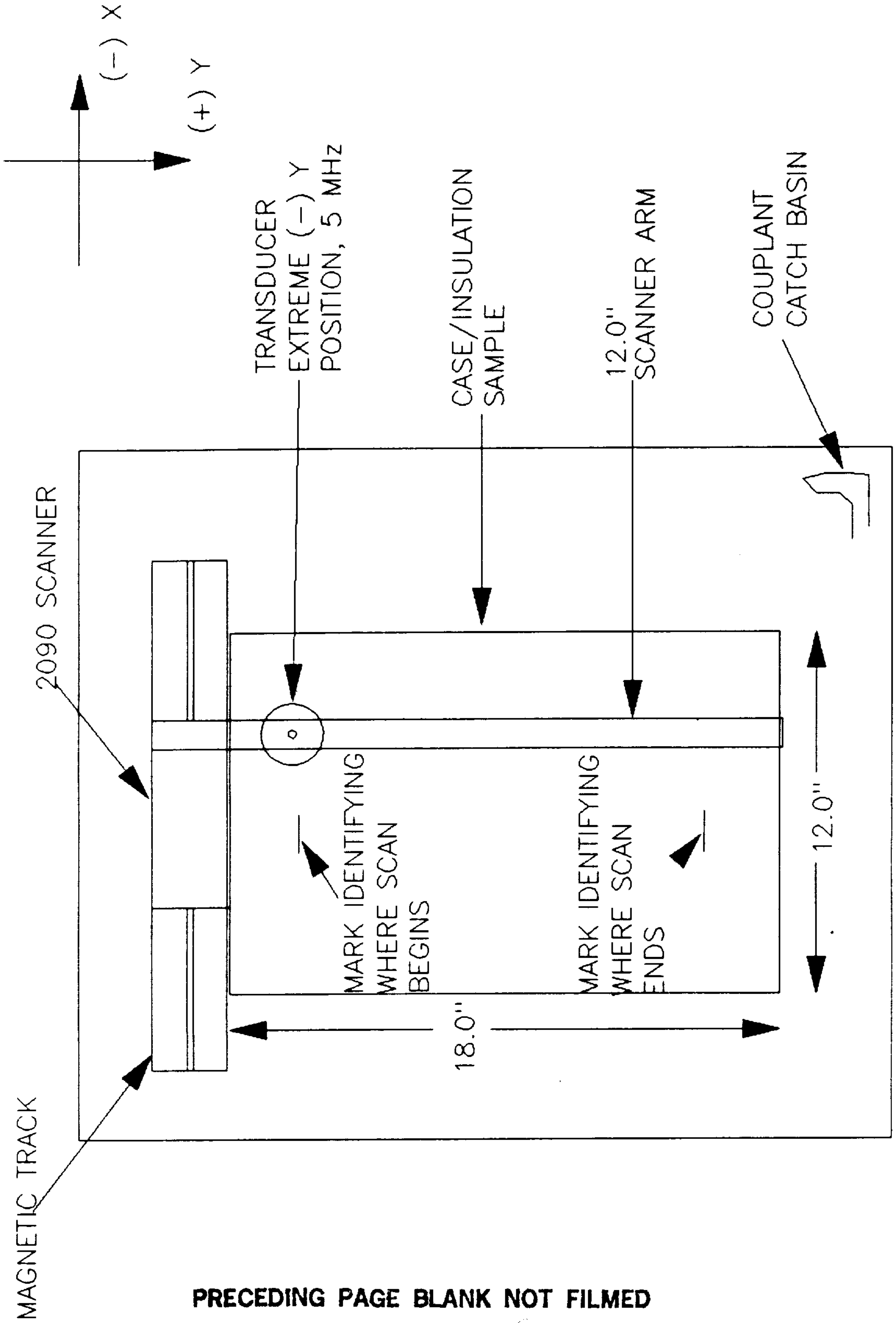

FIGURE 1

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X-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 16 Feb 89	SYSTEM SERIAL NUMBER: SA-51866
OPERATOR: Brad Cushing	TRANSDUCER SERIAL NUMBER: T8359
VERIFIED BY: J. Kamer	STOP WATCH MANUFACTURER: Citizen
SOFTWARE VERSION NUMBER: 4.0	

PART 1. X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BC
b)	10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h)	PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~16.0~~ IN./TIME)
RUN 1	5.88 sec	2.72 in/sec
RUN 2	5.94 sec	2.70 in/sec
RUN 3	5.91 sec	2.70 in/sec

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

   IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	______________	__________________________
RUN 2	______________	__________________________
RUN 3	______________	__________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

   CORRECTIVE ACTION(S) ____
   ____
   ____
   ____

   IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. X-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	7.54 sec	2.12 in/sec
RUN 2	7.66 sec	2.08 in/sec
RUN 3	7.53 sec	2.12 in/sec

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

[redacted]

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. X-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 39.95 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ one pulse width MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	5.86 sec	2.73 "/sec unable to complete
RUN 2	5.80 sec	2.75 "/sec scan due to expected
RUN 3	5.75 sec	2.75 "/sec wave exceeding received waves

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) After length conversation with AMDATA Engineering it was determined that the original target values in this CTP ~~was~~ had exceeded the system limitations. There for this test was executed in a manner to find the maximum reliable scan speed that could be obtained.

IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

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PART 4. X-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
(a) X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b) REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	7.53 sec	2.12 in/sec
RUN 2	7.49 sec	2.13 in/sec
RUN 3	7.45 sec	2.14 in/sec

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	____________	________________________
RUN 2	____________	________________________
RUN 3	____________	________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ____________________________________

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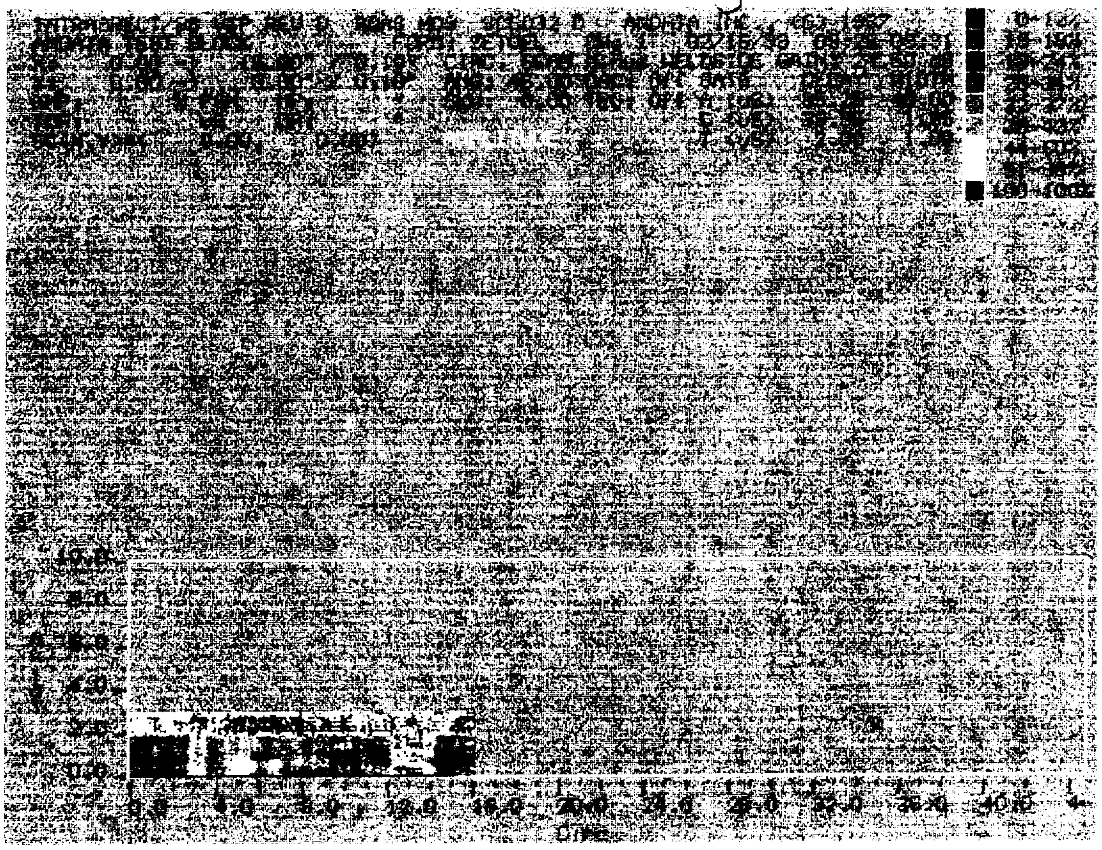
IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

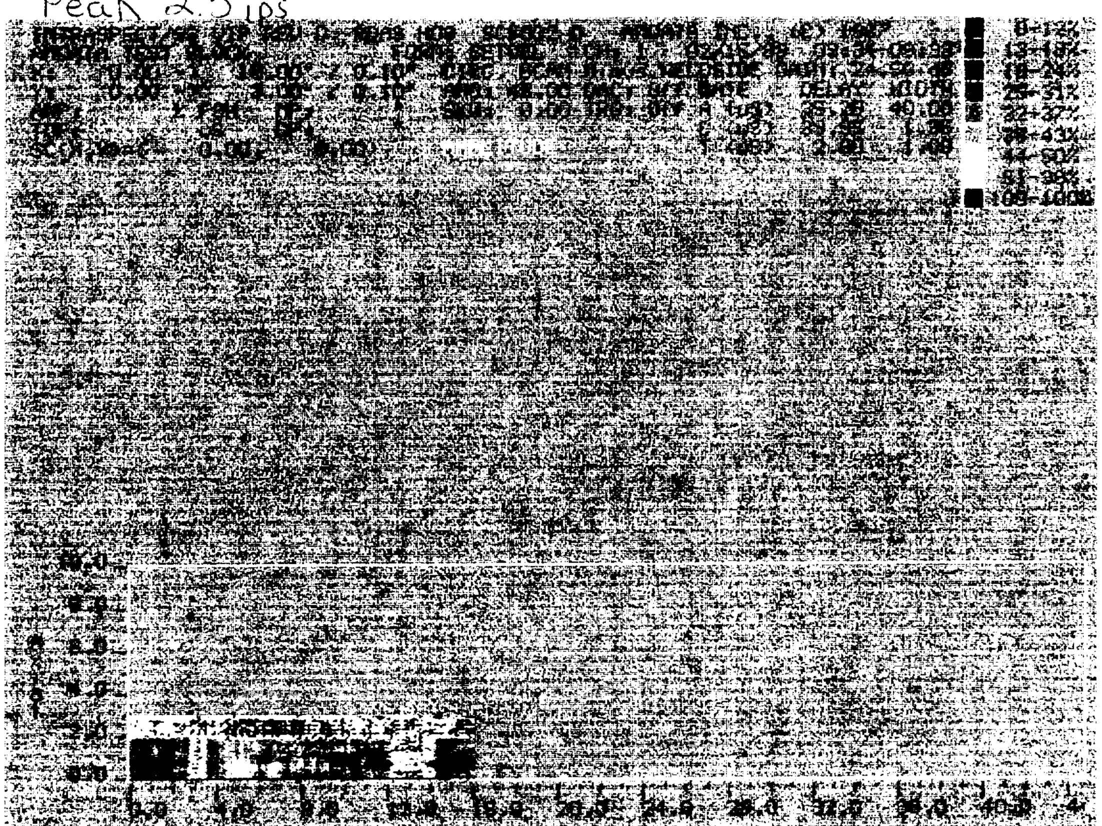
Peak 4.0 ips

ORIGINAL PAGE
COLOR PHOTOGRAPH

X-Axis Scan Velocity



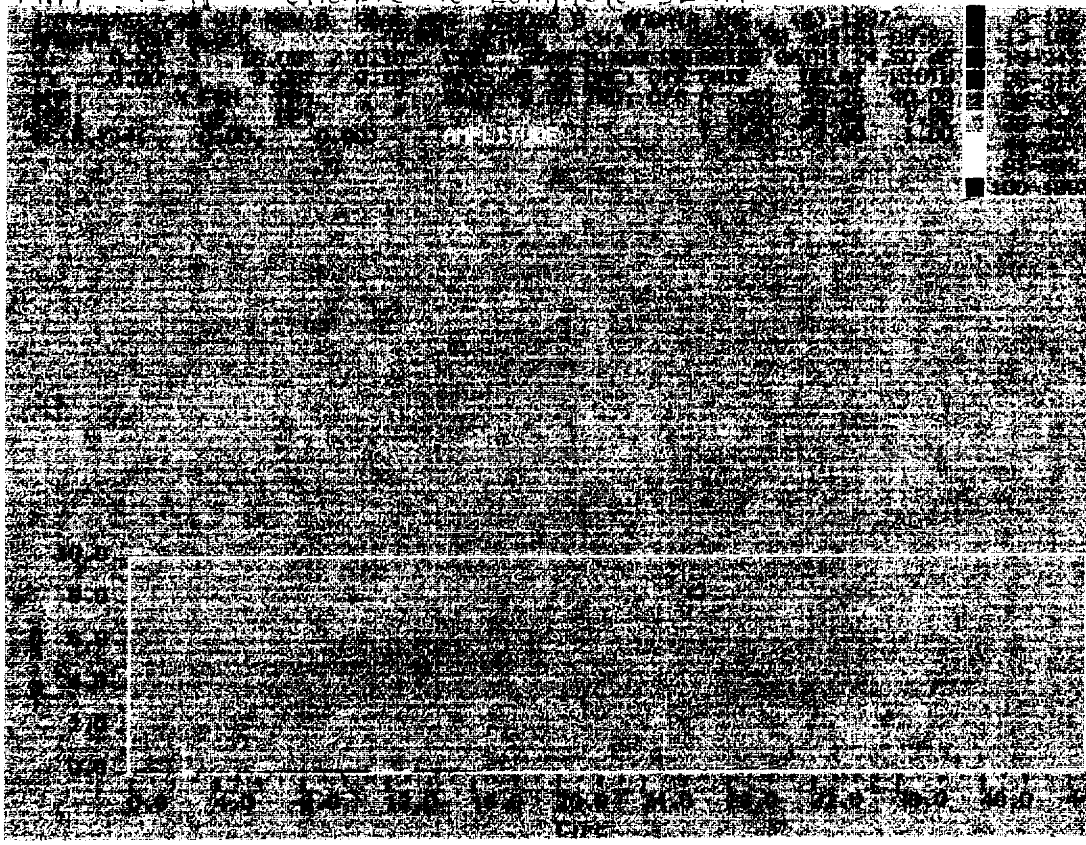
Peak 2.5 ips



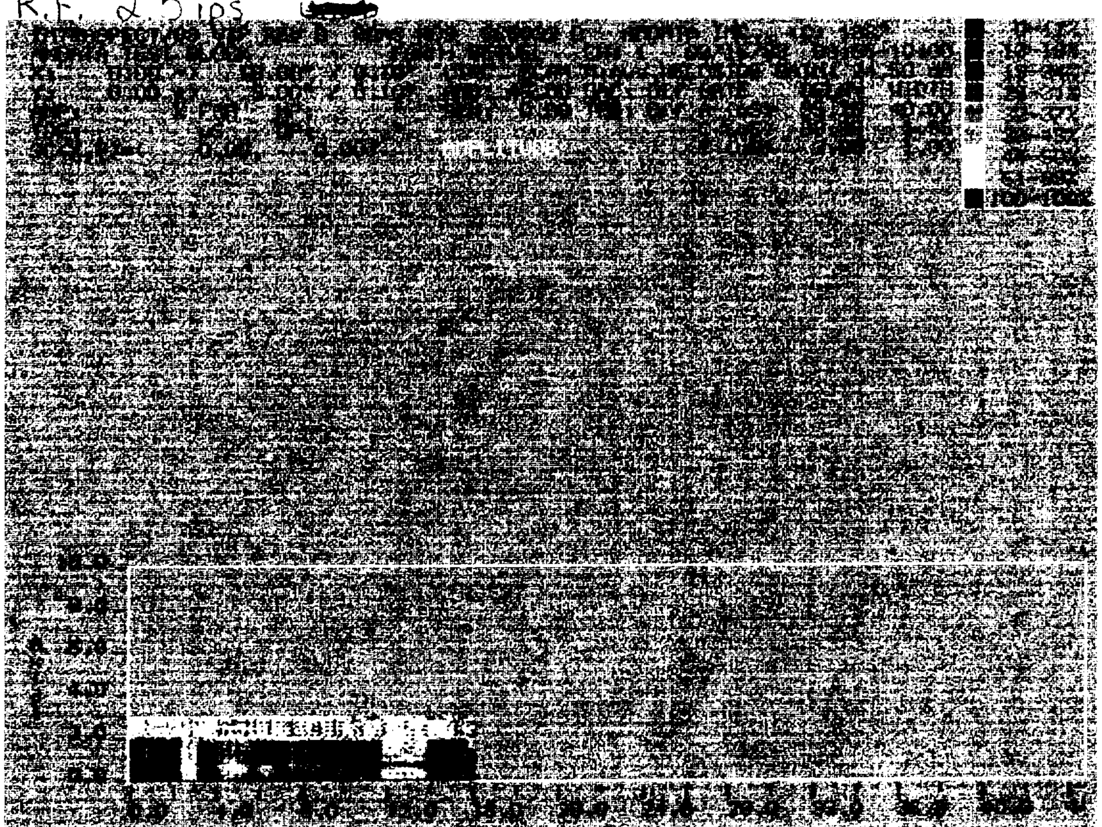
X-Axis Scan Velocity

ORIGINAL PAGE
COLOR PHOTOGRAPH

R.F. 4.0 ips unable to complete scan



R.F. 2.5 ips



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X-AXIS SCAN VELOCITY TEST SET-UP

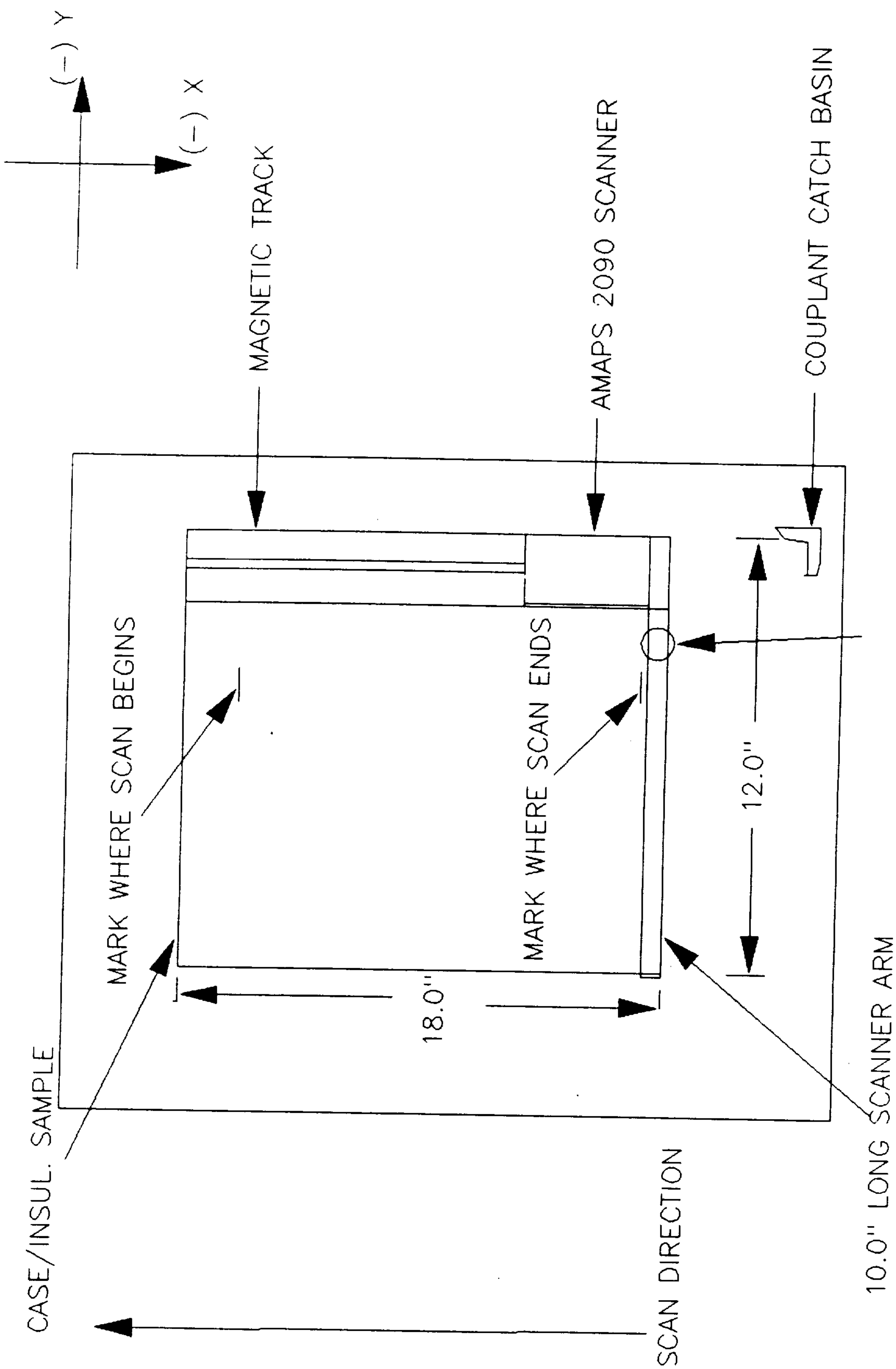

FIGURE 1

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B-182
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X-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 21 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: J. Kyser

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51868

TRANSDUCER SERIAL NUMBER: T8353

STOP WATCH MANUFACTURER: Citizen

PART 1. X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e) A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f) SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h) PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	5.9	2.7
RUN 2	5.9	2.7
RUN 3	6.0	2.6

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	________	________
RUN 2	________	________
RUN 3	________	________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

CORRECTIVE ACTION(S) ____________________

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IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. X-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	7.5	2.1
RUN 2	7.5	2.1
RUN 3	7.6	2.1

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. X-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 22.9 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 1.5 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	6.0	2.6
RUN 2	5.9	2.7
RUN 3	5.9	2.7

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) After conversation with Amdata engineering it was determined that the original target values in this test plan had exceeded the system limitations. Therefore this test was ~~exe~~ executed in a manner to find max scan speed for given parameters

IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. X-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
(a) X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b) REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	7.5	2.1
RUN 2	7.5	2.1
RUN 3	7.6	2.1

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ____

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	____________	________________________
RUN 2	____________	________________________
RUN 3	____________	________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________________
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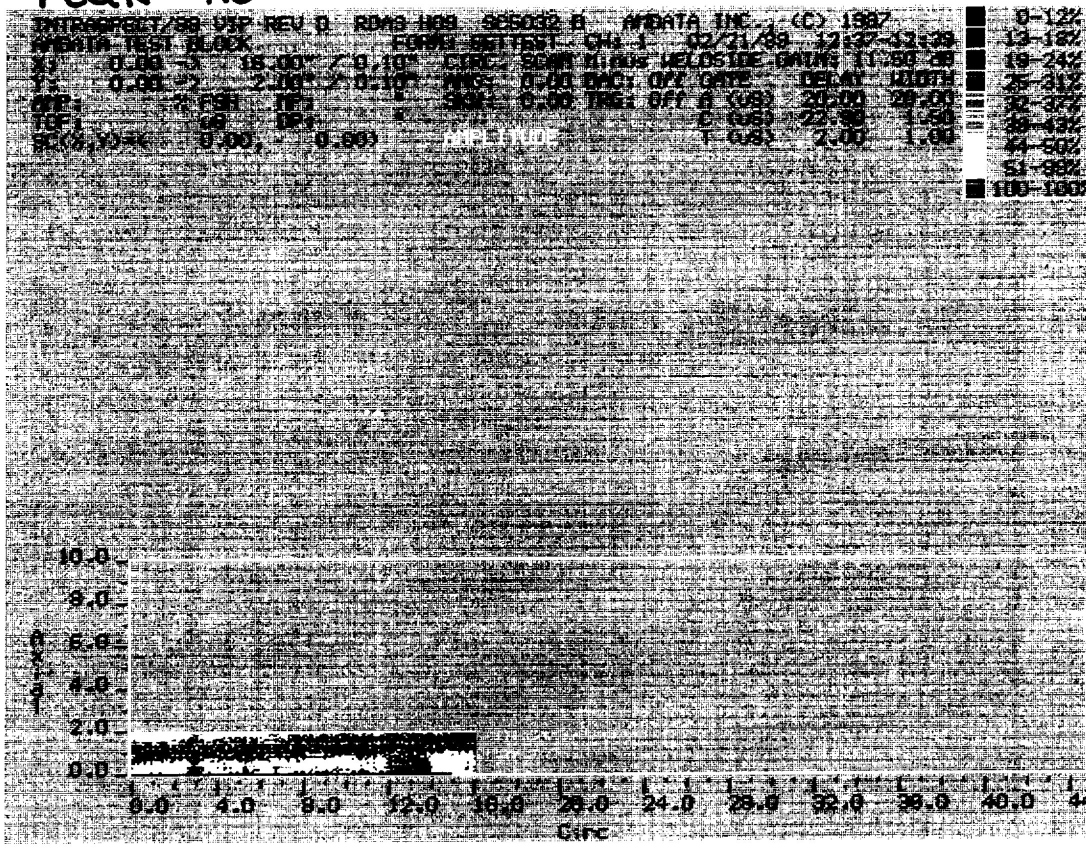
IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

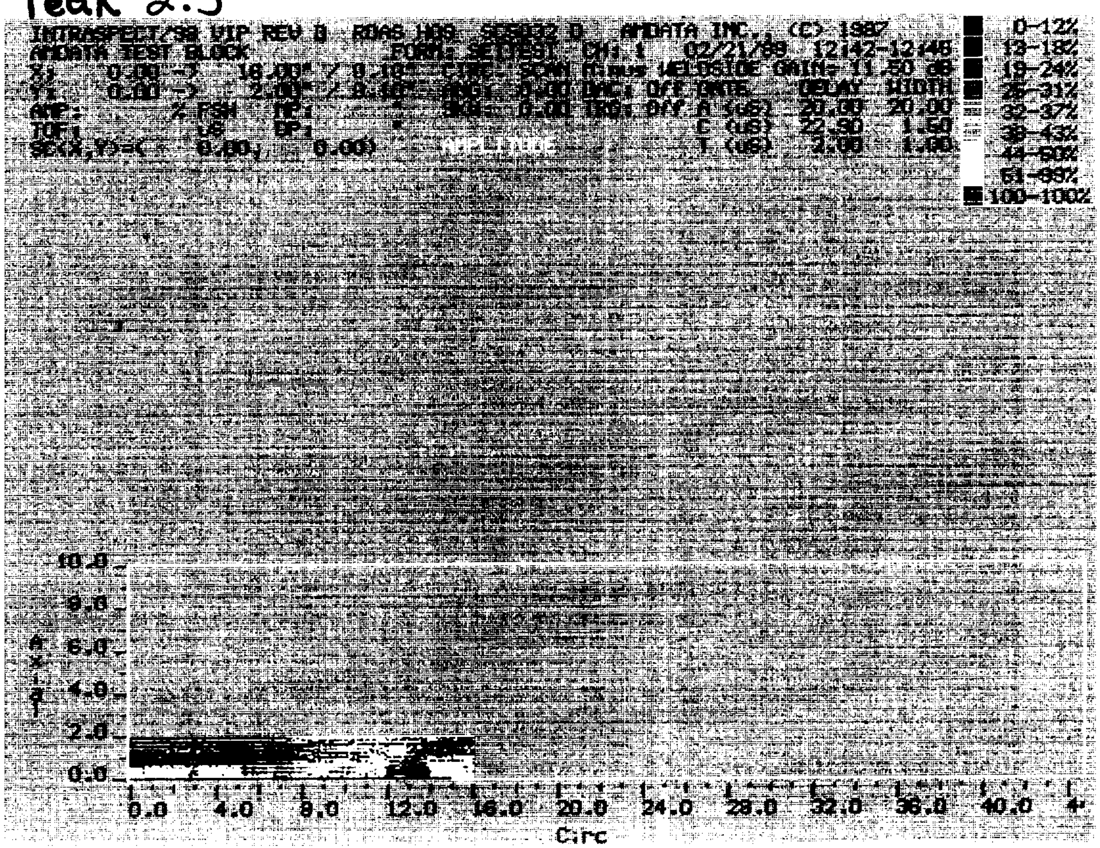
X-Axis Scan Velocity

ORIGINAL PAGE
COLOR PHOTOGRAPH

Peak 4.0



Peak 2.5



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Note – darkened areas of scan are due to a loss of couplant caused by tilting x-ducer.

X-Axis Scan Velocity

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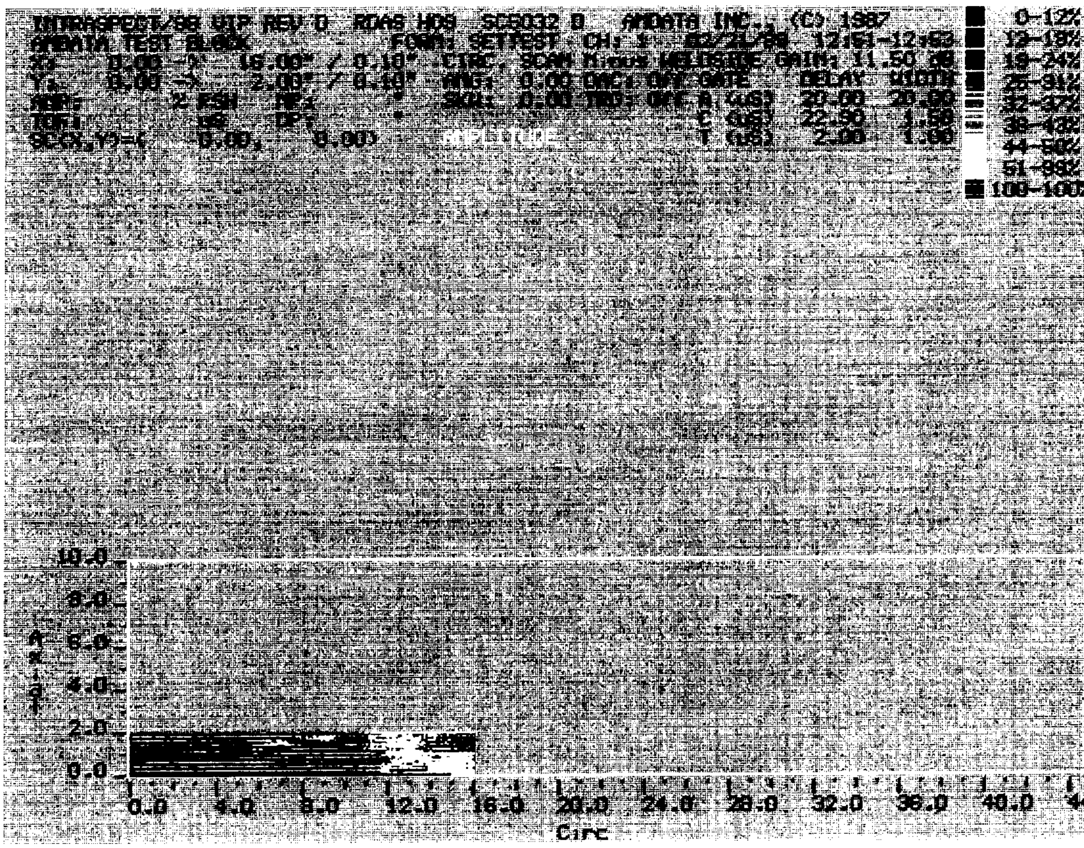
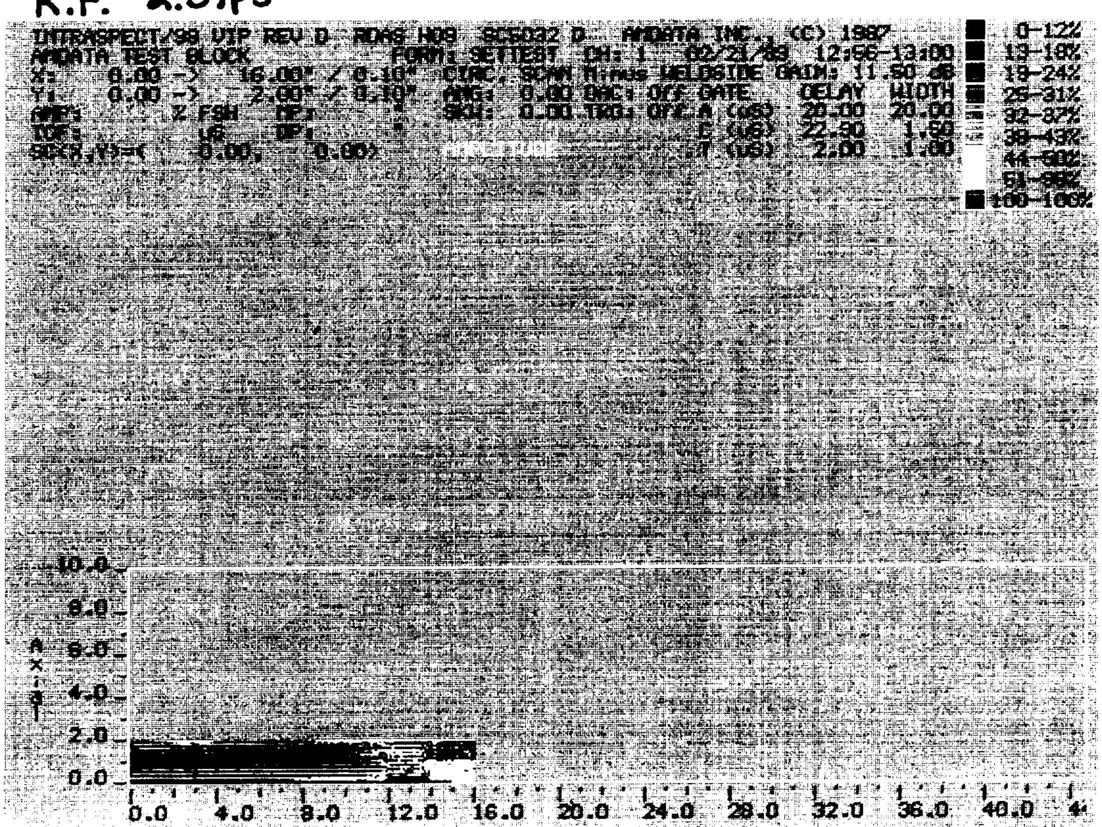
R.F. 4.0 ips



R.F. 2.5ips



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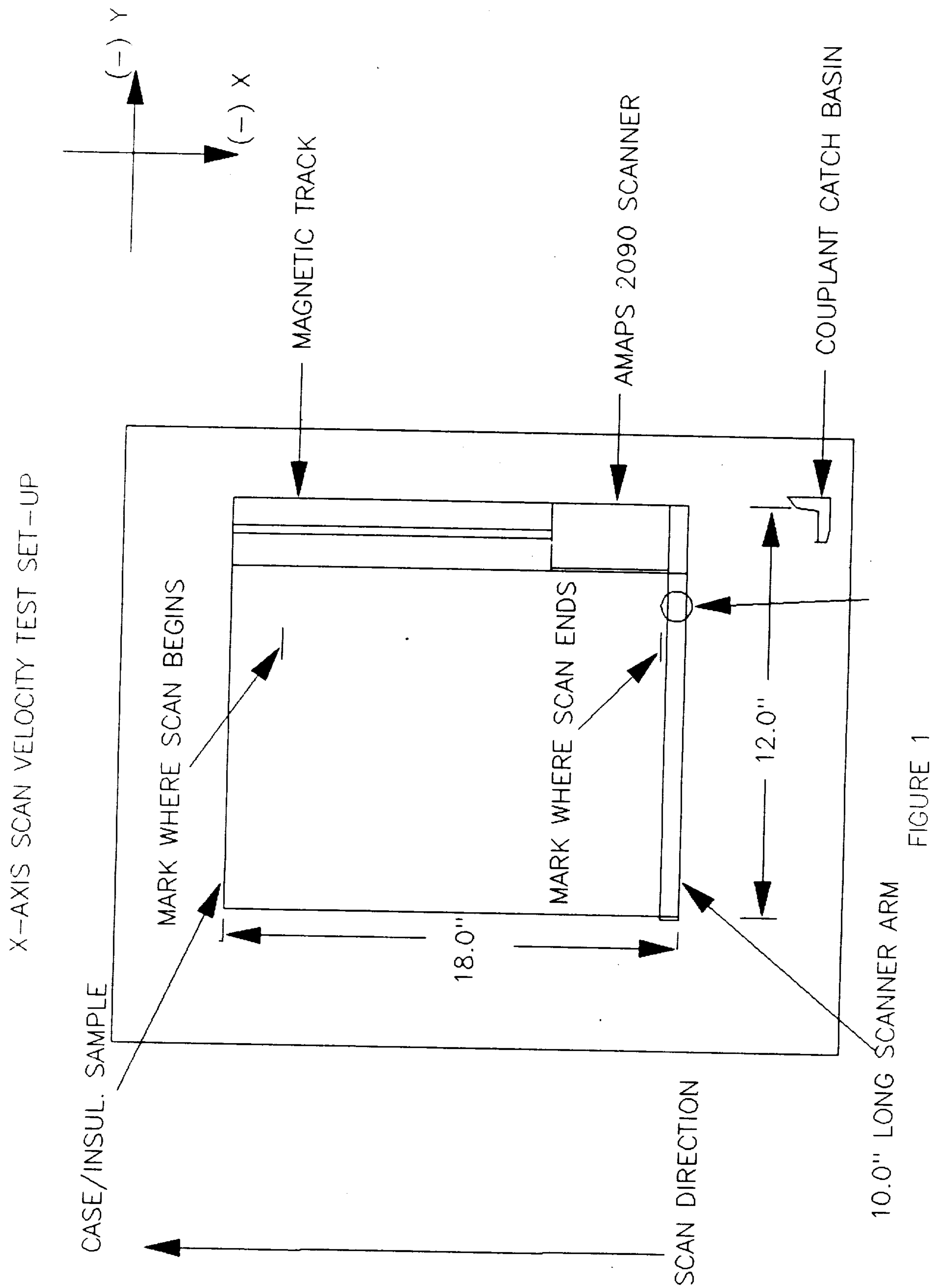

FIGURE 1

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B - 196
B - 197

X-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 9 March 89

OPERATOR: Brad Cushing

VERIFIED BY: [illegible]

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51865

TRANSDUCER SERIAL NUMBER: RD 3

STOP WATCH MANUFACTURER: Citizen

PART 1. X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e) A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f) SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h) PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~16.0~~ 10.0 IN./TIME)
RUN 1	3.7	2.7
RUN 2	3.7	2.7
RUN 3	3.6	2.7

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	______________	__________________________
RUN 2	______________	__________________________
RUN 3	______________	__________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

CORRECTIVE ACTION(S) ____
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IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. X-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~16.0~~ 10.0 IN./TIME)
RUN 1	4.6	2.1
RUN 2	4.8	2.0
RUN 3	4.7	2.1

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. X-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

A) PLACE SYSTEM IN RF MODE
B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 13.5 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 2.35 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~16.0~~ 10.0 IN./TIME)
RUN 1	3.6	2.7
RUN 2	3 6	2.7
RUN 3	3.7	2.7

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) After conversation with AMDATA engineering it was determined that the original target values in this testplan had exceeded the system limitations. Therefore this test was executed in a manner to find max scan speed for given parameters.

IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. X-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
(a)	X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b)	REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (~~16.0~~ 10.0 IN./TIME)
RUN 1	4.7	2.1
RUN 2	4.7	2.1
RUN 3	4.8	2.0

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	____________	________________________
RUN 2	____________	________________________
RUN 3	____________	________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________________
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IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

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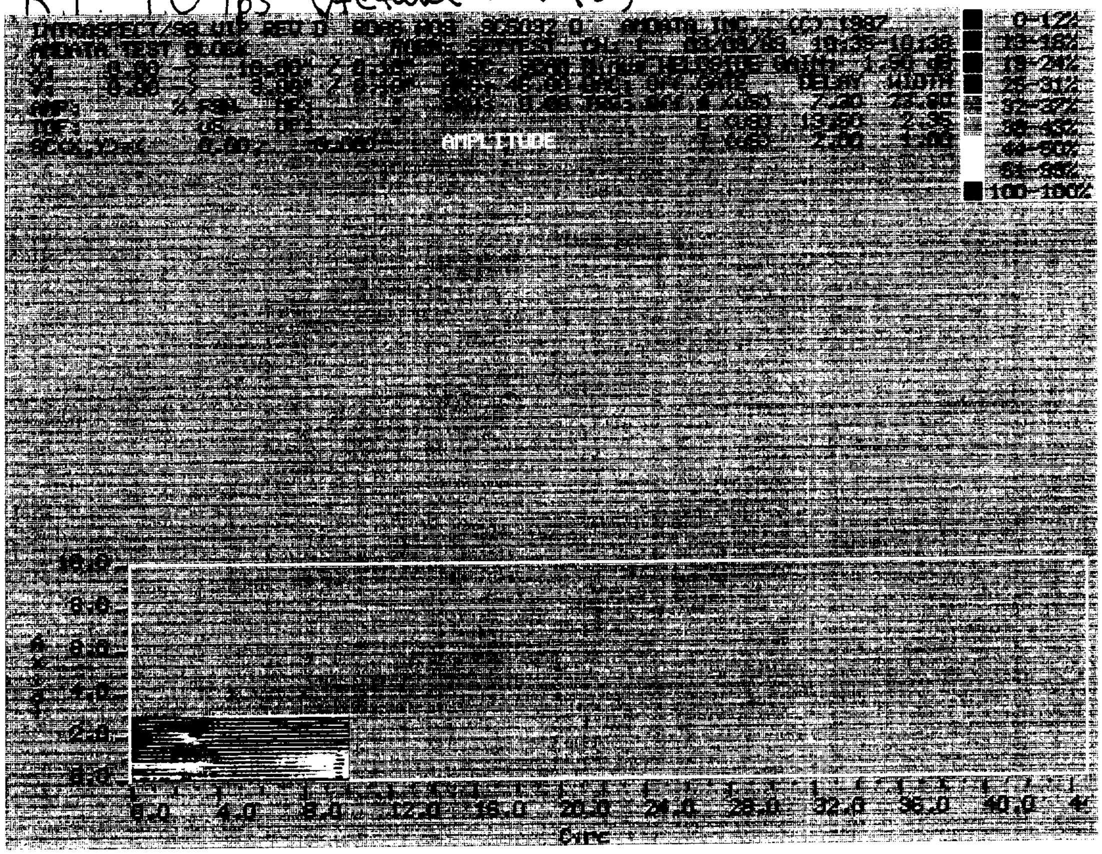
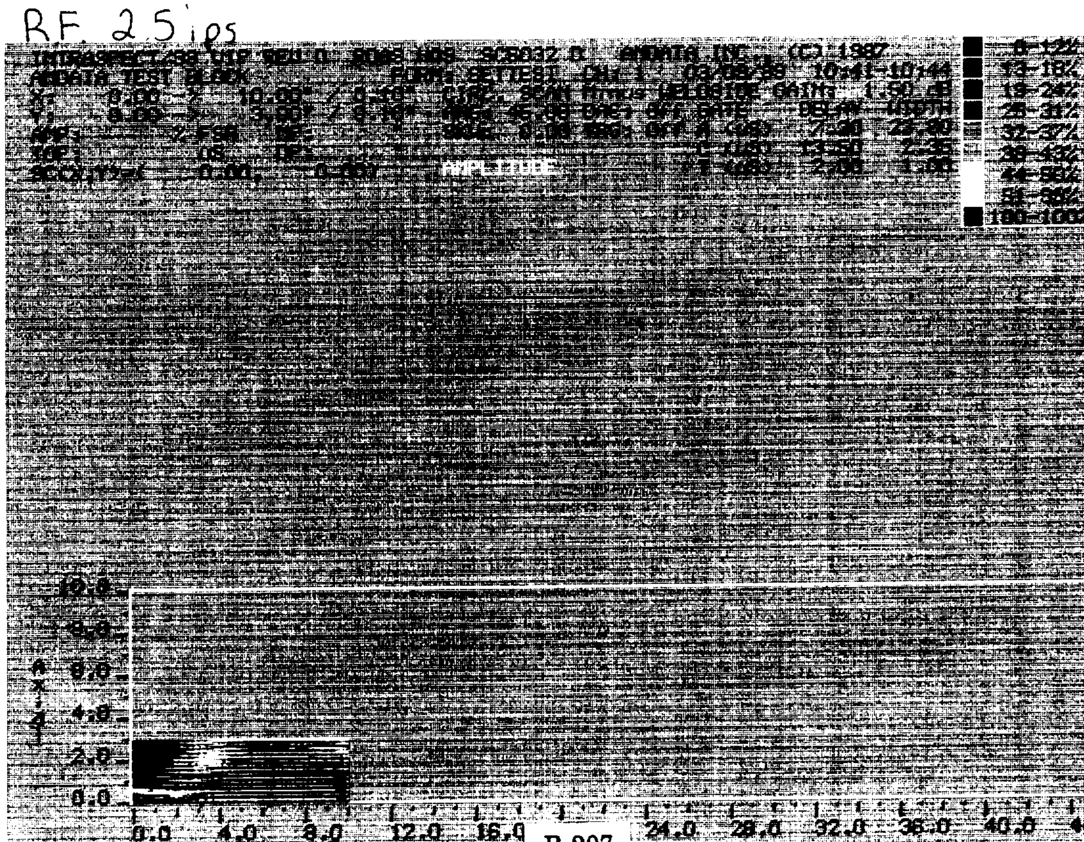
X-Axis Scan Velocity

ORIGINAL PAGE
COLOR PHOTOGRAPH

Target
R.F. 40 ips (Actual 2.7 ips)



R.F. 25 ips



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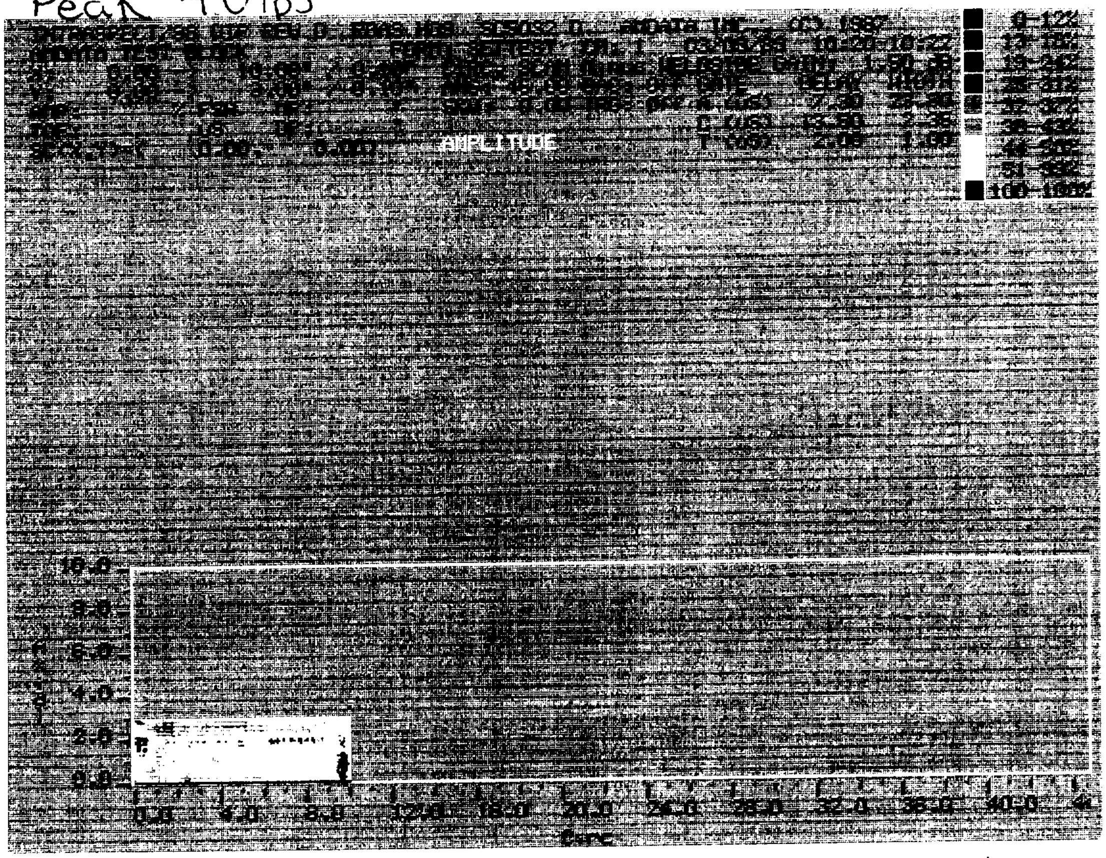
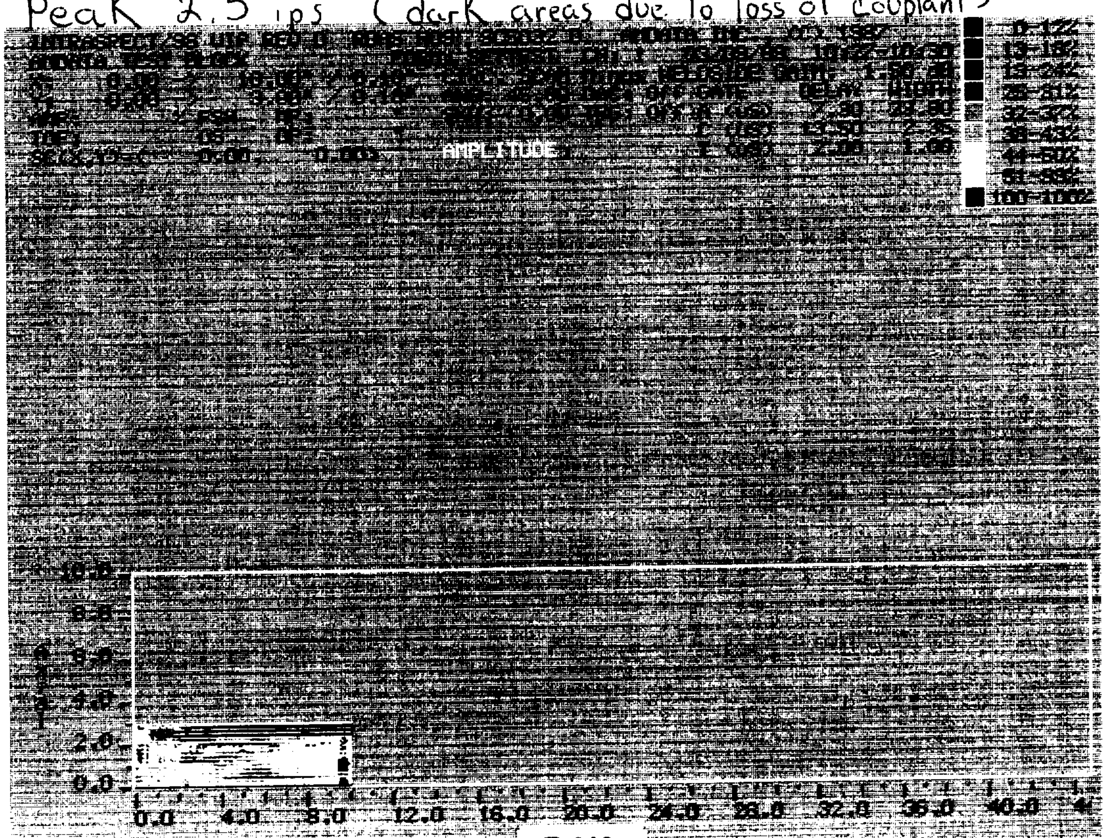
X-Axis Scan Velocity

ORIGINAL PAGE COLOR PHOTOGRAPH

Peak 4.0 ips



Peak 2.5 ips (dark areas due to loss of couplant)



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X-AXIS SCAN VELOCITY TEST SET-UP

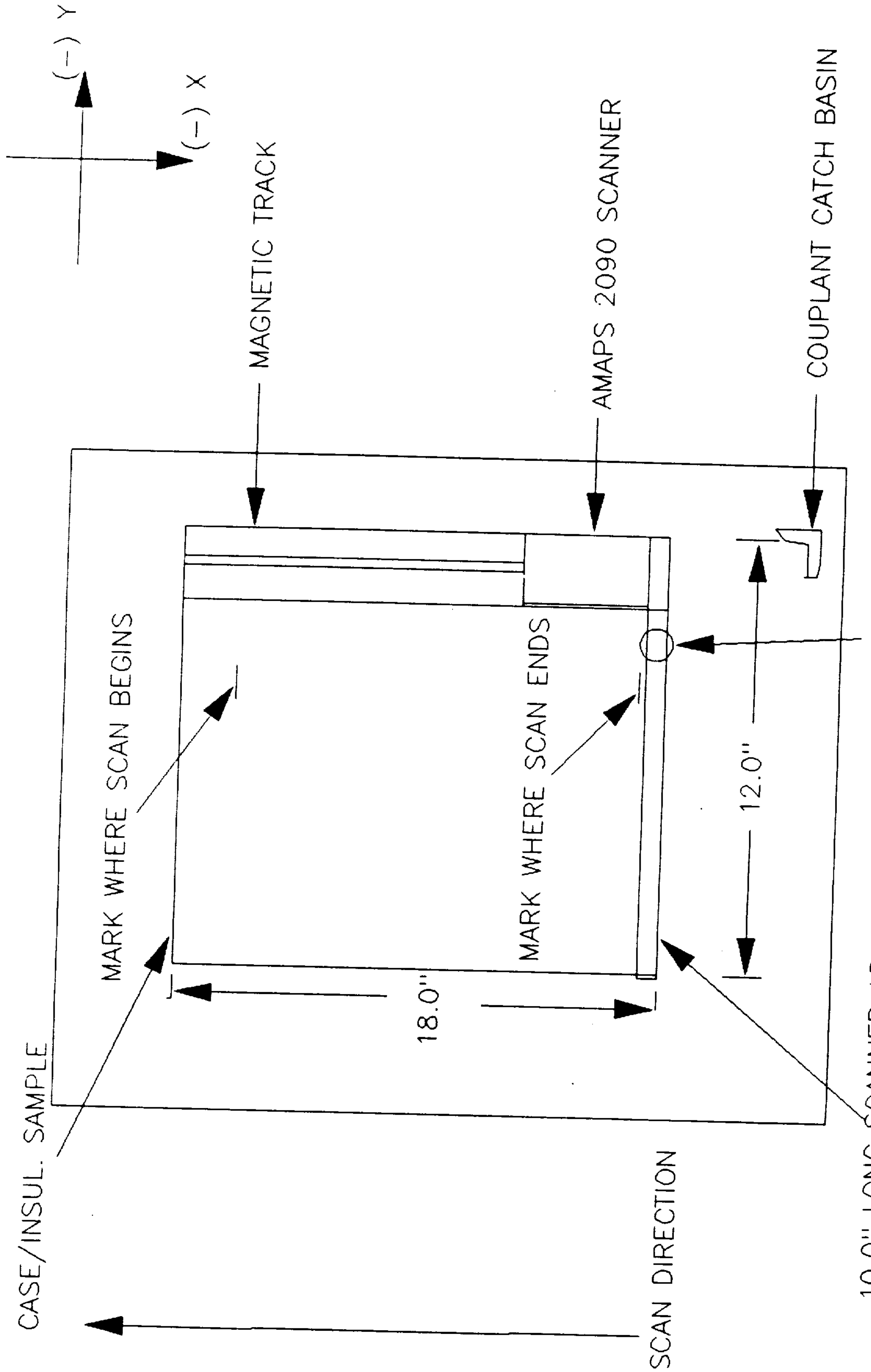

FIGURE 1

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B-210
B-211

X-AXIS SCANNING VELOCITY VERIFICATION TESTS PEAK DETECT AND RF MODES

DATE: 23 May 89

OPERATOR: B Cushing

VERIFIED BY:

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: 8A51869

TRANSDUCER SERIAL NUMBER: RND-3

STOP WATCH MANUFACTURER: Citizen

PART 1. X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e) A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f) SYSTEM IS PEAK DETECTING OFF THE EIGHTH MULTIPLE BACK-WALL REFLECTION	BSC
g) FIGURE 1 OF THIS FORM HAS BEEN REVIEWED AS SO PROPER TEST SET-UP IS ACHIEVED	BSC
h) PRINTER IS CONFIGURED PROPERLY	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	5.84	2.7 ips
RUN 2	5.93	2.7 ips
RUN 3	5.88	2.7 ips

(PART 1 CONT.)

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, PROCEED TO PART 2 OF THIS FORM.

   IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	____________	______________________
RUN 2	____________	______________________
RUN 3	____________	______________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN, ATTACH IT TO THIS FORM, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO PART 2 OF THIS FORM.

   CORRECTIVE ACTION(S) ____________________________
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   IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, (B) ATTACH IT TO THIS FORM, (C) COMPLETE A PROBLEM /FAILURE REPORT, FORM N, AND (D) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 2. X-AXIS SCANNING VELOCITY (PEAK DETECT @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
b) REMAINING PARAMETERS FROM PART 1 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	7.58	2.1 ips
RUN 2	7.62	2.1 ips
RUN 3	7.55	2.1 ips

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES ARE WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, MAKE A HARD COPY OF THE SCREEN PRESENTATION, ATTACH IT TO THIS FORM, AND PROCEED TO PART 3 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD INFORMATION FROM THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED PART 3 OF THIS FORM.

IF THE DIFFERENCE IS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N , AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 3. X-AXIS SCANNING VELOCITY VERIFICATION TEST (RF MODE)

1) PERFORM STEPS 1 THROUGH 5 OF THE X-AXIS SCANNING VELOCITY VERIFICATION TEST (PEAK DETECT) EXCEPT FOR THE FOLLOWING:

   A) PLACE SYSTEM IN RF MODE
   B) SET C-SCAN GATE DELAY TO 20 MICROSECONDS
   C) SET C-SCAN GATE WIDTH TO 30 MICROSECONDS

2) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHz TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS BEING USED ..	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	X-AXIS SCAN VELOCITY IS PROGRAMED TO 4.0 IN./SEC.	BSC
e)	A/D SAMPLING RATE IS AT 20.0 MHz	BSC
f)	SYSTEM IS IN RF MODE	BSC
g)	C-SCAN GATE DELAY IS ~~20.0~~ 47.25 MICROSECONDS ...	BSC
h)	C-SCAN GATE WIDTH IS ~~30.0~~ 4.9 MICROSECONDS ...	BSC
i)	FIGURE 1 OF THIS FORM HAS BEEN REVIEWED SO PROPER TEST SET-UP IS ACHIEVED	BSC
j)	PRINTER IS CONFIGURED PROPERLY	BSC

3) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	5.80	2.7
RUN 2	5.83	2.7
RUN 3	5.78	2.7

4) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN AND ATTACH IT TO THIS FORM, AND (B) PROCEED TO PART 4 OF THIS FORM.

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-CHECK TEST.

5) RECORD INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1		
RUN 2		
RUN 3		

6) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN DATA PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO PART 4 OF THIS FORM.

CORRECTIVE ACTION(S) After conversation with Amdata engineering it was determined that the original target values in this test plan had exceeded the system limitations. Therefore this test was executed in a manner to find max scan speed for given parameters

IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, MAKE A HARD COPY PRESENTATION OF THE SCREEN DISPLAY, ATTACH IT TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

PART 4. X-AXIS SCANNING VELOCITY (RF MODE @ 2.5 IN./SEC.)

1) COMPLETE FOLLOWING CHECKLIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
(a)	X-AXIS SCAN VELOCITY IS PROGRAMMED TO 2.5 IN./SEC.	BSC
(b)	REMAINING PARAMETERS FROM PART 3 OF THIS FORM HAVE NOT BEEN CHANGED	BSC

2) PERFORM TEST THREE TIMES AND RECORD RESULTS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	7.50	2.1 ips
RUN 2	7.47	2.1 ips
RUN 3	7.53	2.1 ips

3) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ______________________________

IF THE DIFFERENCE IS GREATER THAN ± 0.5 IN./SEC., RE-CHECK ALL CONNECTIONS AND VALUES ENTERED INTO SET FORM. RE-PERFORM TEST.

4) RECORD THE INFORMATION FROM THE THREE RUNS IN SPACE BELOW.

	TIME	VELOCITY (16.0 IN./TIME)
RUN 1	______________	____________________________
RUN 2	______________	____________________________
RUN 3	______________	____________________________

5) IF THE DIFFERENCE BETWEEN THE INDICATED AND ACTUAL SCAN VELOCITIES IS WITHIN ± 0.5 IN./SEC., AND THE SCREEN PRESENTATION IS ACCEPTABLE, (A) MAKE A HARD COPY OF THE SCREEN PRESENTATION, (B) ATTACH IT TO THIS FORM, (C) NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND (D) PROCEED TO THE UNINTERRUPTABLE POWER SUPPLY VERIFICATION TEST.

CORRECTIVE ACTION(S) ____
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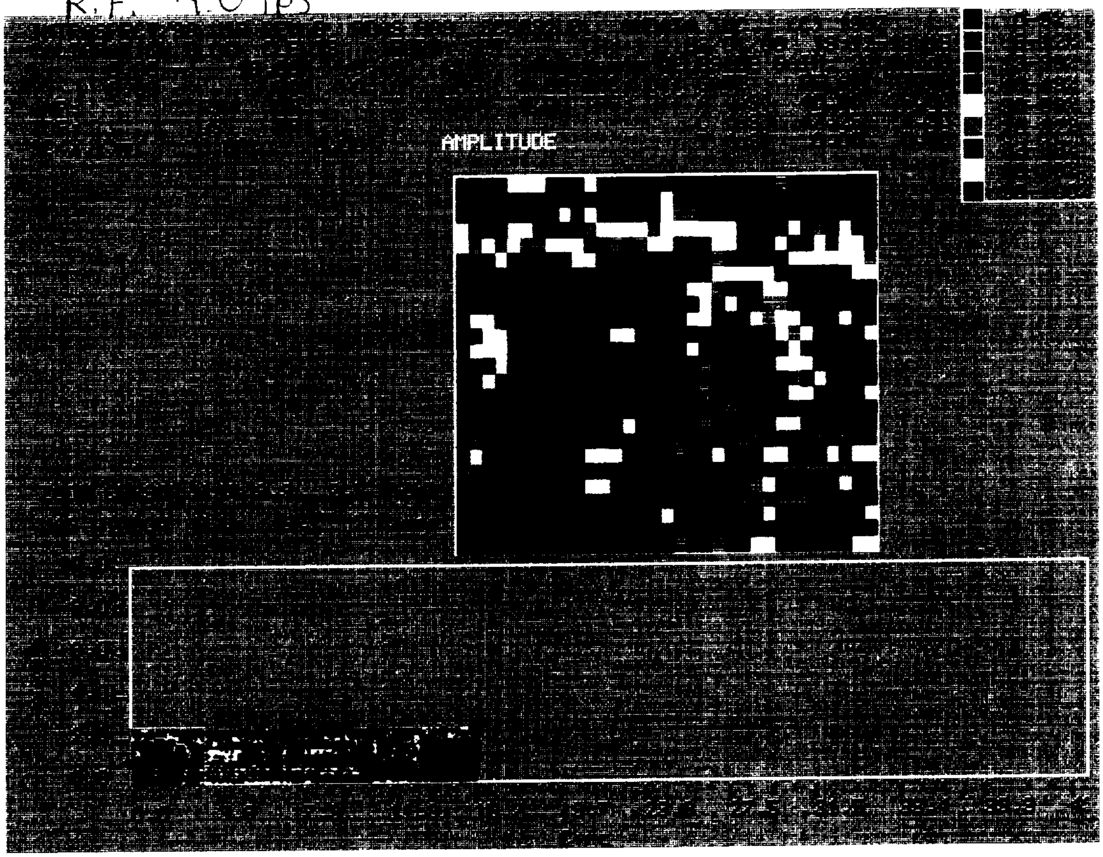
IF THE DIFFERENCE WAS STILL UN-RESOLVABLE, (A) COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND (B) NOTIFY MTI ELECTRONIC MAINTENANCE.

***NOTE: BE PREPARED TO GIVE THE SPECIFICS OF THE PROBLEM.

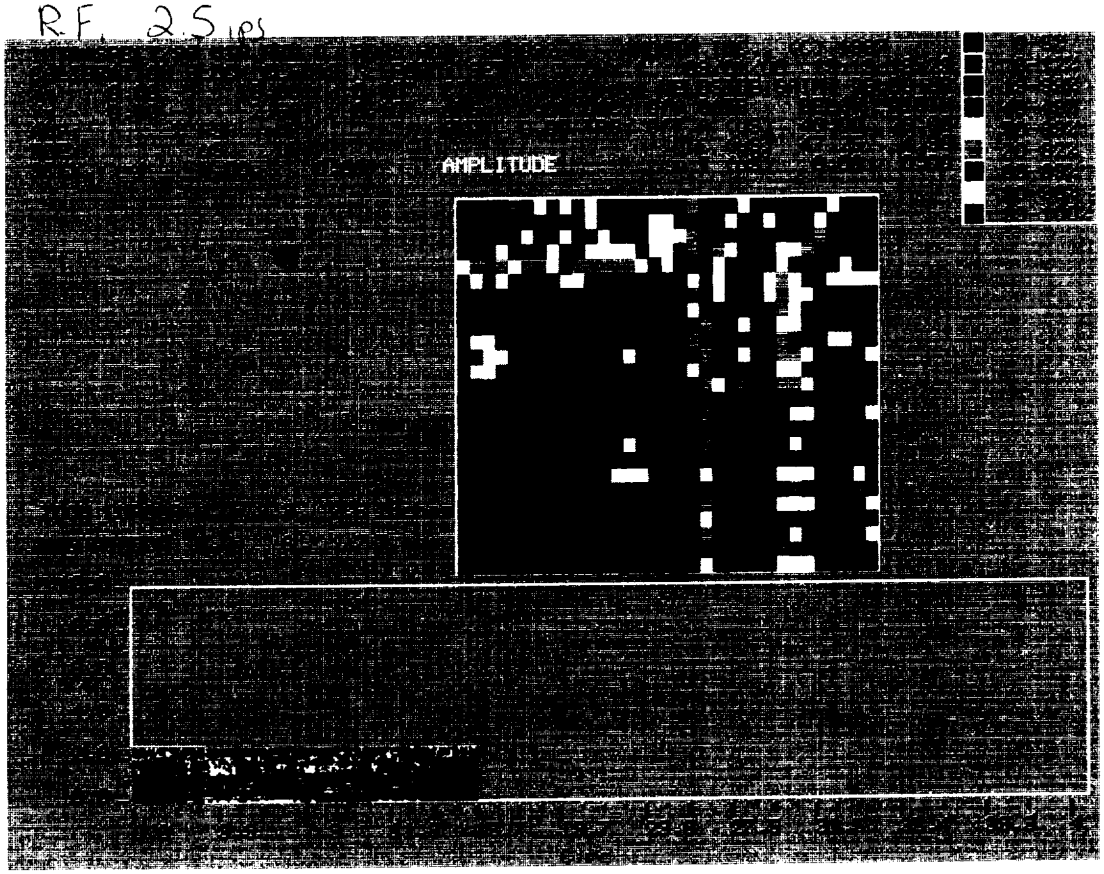
~~X-X~~ X-Axis Scan Velocity

ORIGINAL PAGE
COLOR PHOTOGRAPH

R.F. 4.0 ips



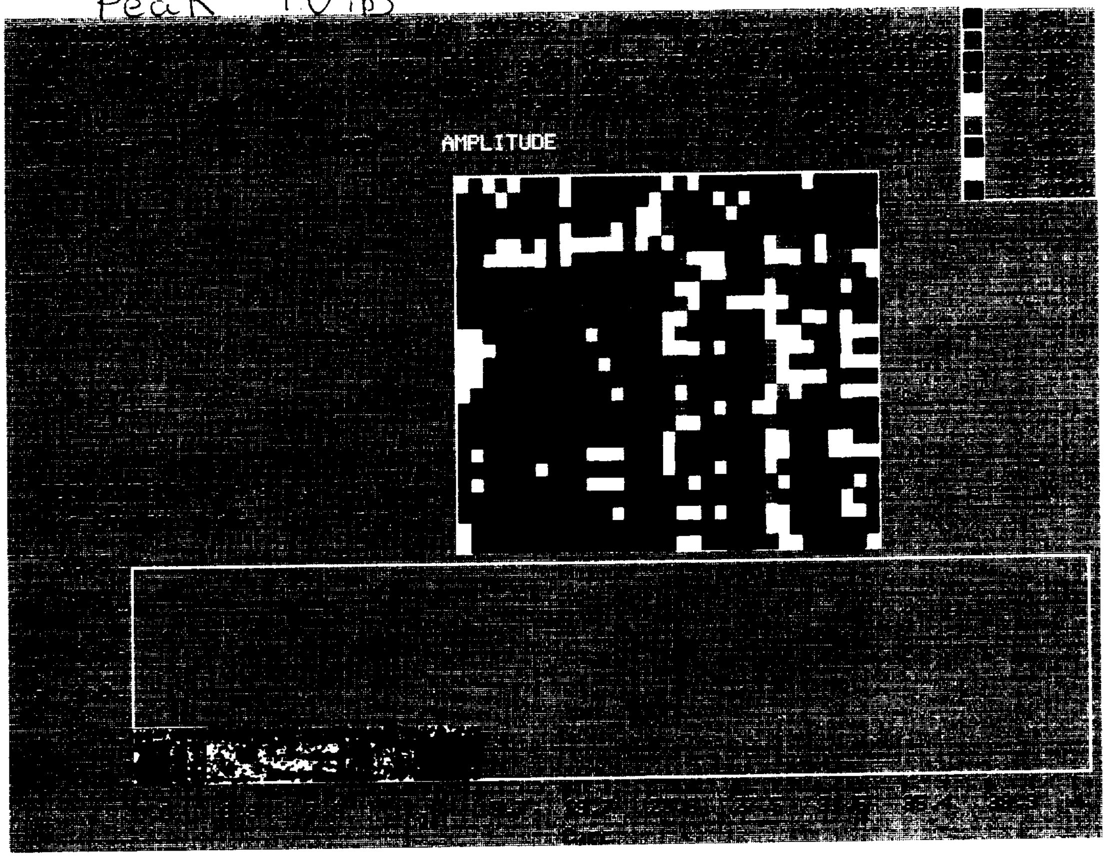
R.F. 2.5 ips



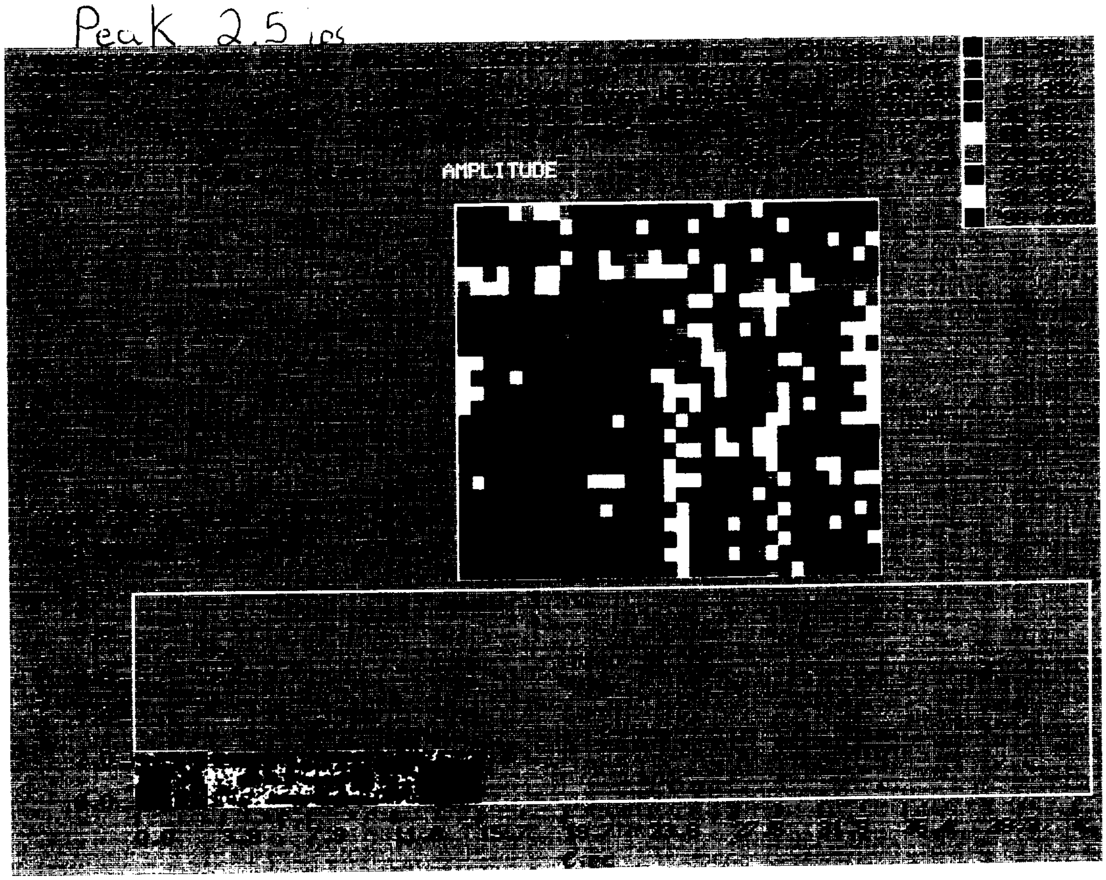
X-Axis Scan Velocity

ORIGINAL PAGE
COLOR PHOTOGRAPH

Peak 4.0 ips



Peak 2.5 ips



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X-AXIS SCAN VELOCITY TEST SET-UP

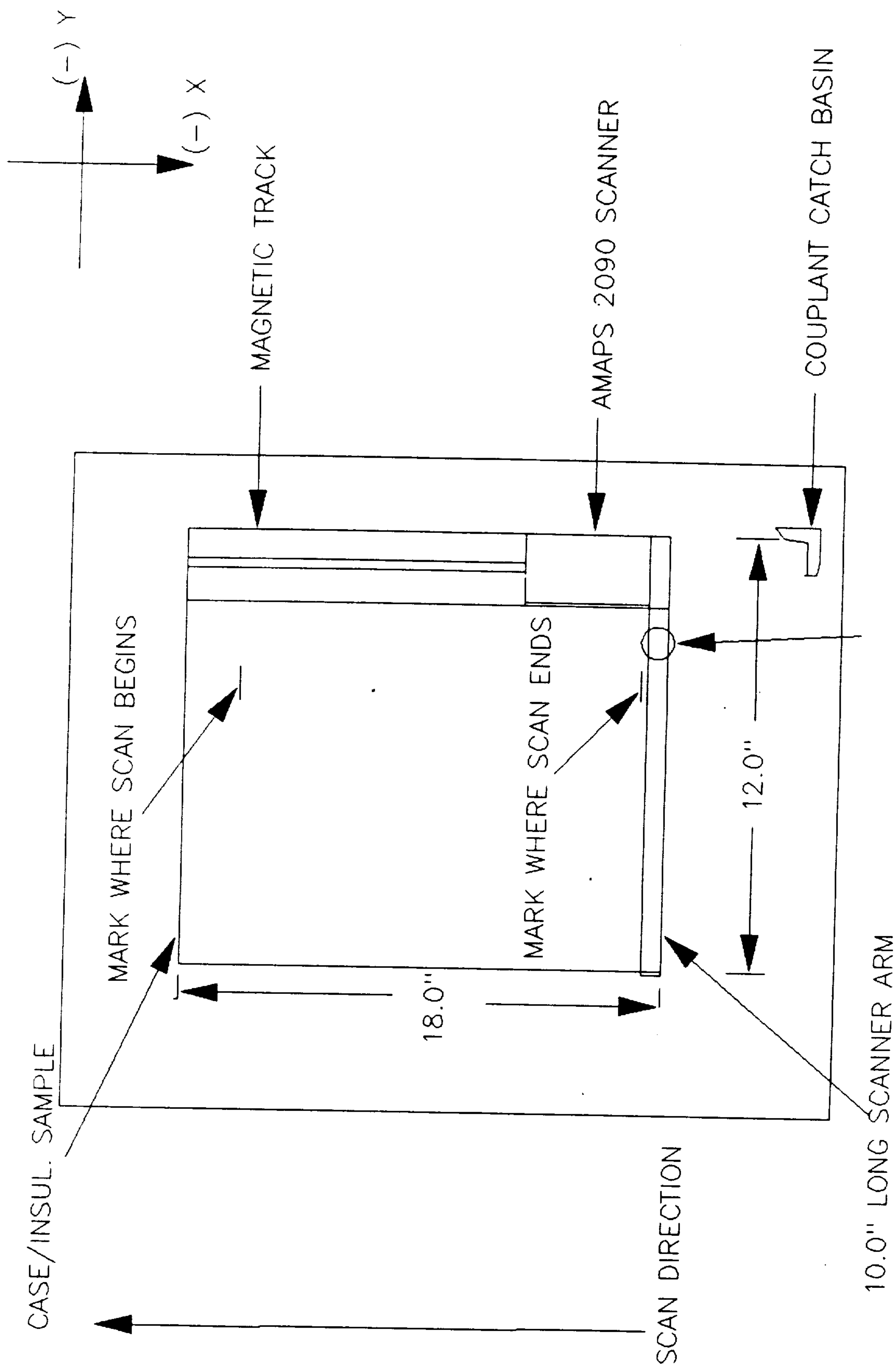

FIGURE 1

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UNINTERUPTABLE POWER SUPPLY
VERIFICATION TEST

DATE: 7/13/89

OPERATOR: B Cushing

VERIFIED BY:

SOFTWARE VERSION NUMBER: 4 C

SYSTEM SERIAL NUMBER: S-A51866

TOPAZ SERIAL NUMBER: S-A51866-3

TRANSDUCER SERIAL NUMBER: T8359

1) COMPLETE THE CHECK LIST BEFORE PERFORMING THE TEST.

COMPLETED

- O 5.0 MHz TRANSDUCER IS BEING USED — BJC
- O 10.0" LONG SCANNER ARM IS BEING USED — BJC
- O TOPAZ UNINTERUPTABLE POWER SUPPLY HAS BEEN SUFFICIENTLY CHARGED — BJC
  ***NOTE: IF THE TOPAZ HAS NOT BEEN CHARGED PROPERLY, THIS TEST WILL TERMINATE HERE UNTIL THE TOPAZ IS PROPERLY CHARGED.
- O SYSTEM IS IN THE RF MODE — BJC
- O C-SCAN GATE DELAY IS AT 20.0 MICROSECONDS
- O C-SCAN GATE WIDTH IS AT ~~30.0~~ 3.75 MICROSECONDS — BJC
- O FIGURE 1 OF THIS FORM HAS BEEN REVIEW AS SO A PROPER TEST CONFIGURATION IS ACHIEVED — BJC
- O OPERATOR IS FAMILIAR WITH AMDATA ENGINEERING SPECIFICATION 870128, SECTION 1.0, SUB SECTION "UNINTERUPTABLE POWER SYSTEM (UPS) AND LINE FILTER. — BJC
- O SCAN WILL COVER A ~~16.0"~~ 5.0" AXIAL BY ~~10.0"~~ 3.0" CIRCUMFERENTIAL AREA — BJC

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OF POOR QUALITY

2) THERE WILL BE THREE RUNS OF THIS TEST, FILE NAMES WILL BE:

TEST RUN #	FILE NAME
1	SETPWR1 Power shutdown at 1.0"y
2	SETPWR2 Power shutdown at 3.0"y
3	SETPWR3 Power shutdown at 2.0"y

3) BEGIN SCAN, ALLOW AT LEAST 5 PASSES OF THE TRANSDUCER OVER THE MEMBRANE SAMPLE BEFORE DISCONNECTING THE MAIN ELECTRICAL LINE.

4) COMPLETE EACH PART OF THIS CHART IN ACCORDANCE WITH THE TEST RUN NUMBER. ALSO PROVIDE A HARD COPY OF BOTH THE B AND C SCANS FROM EACH TEST RUN.

***NOTE: IF ANY ONE OF THE THREE TEST RUNS DOES NOT PRODUCE A DATA FILE WITH PROPERLY STORED A AND C SCANS, COMPLETE THE FOLLOWING:

a) CHECK ALL CONNECTIONS

b) CHECK ALL ENTRIES INTO THE SET FORMS

c) VERIFY THAT NONE OF THE UPS LIMITATIONS HAVE BEEN EXCEEDED PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 1.0, RE-PERFORM TEST.

d) IF PROBLEM STILL PERSISTS, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

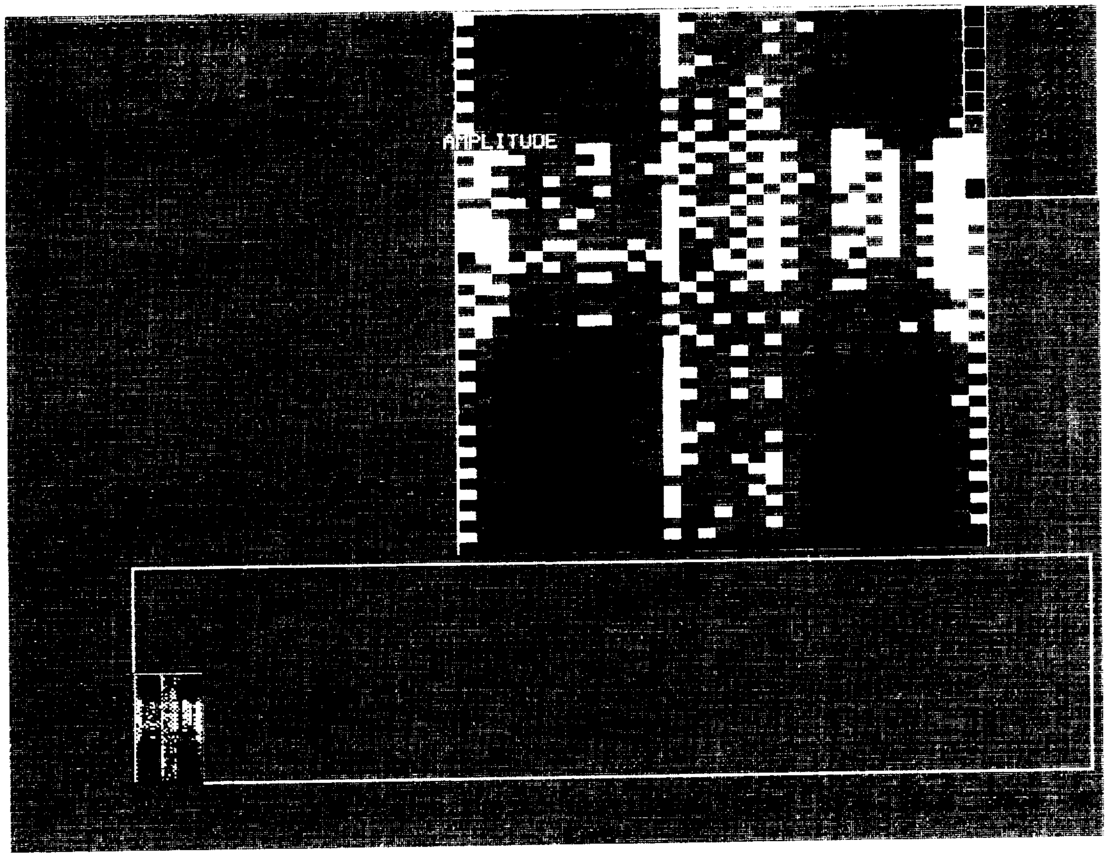
(4 CONT.)

TEST RUN NUMBER
(CIRCLE YES OR NO)

	1	2	3
PROPER DATA STORAGE ACHIEVED	YES NO	YES NO	YES NO
WAS DATA FILE ABLE TO BE RE ACCESSED	YES NO	YES NO	YES NO
WERE A AND C SCAN PRESENTATIONS COMPLETE	YES NO	YES NO	YES NO

REMARK ON ANY CORRECTIVE ACTIONS TAKEN TO RESOLVE PROBLEMS DURING ANY OF THE THREE TEST RUNS. N/A

Setpwr 1 Power shut from



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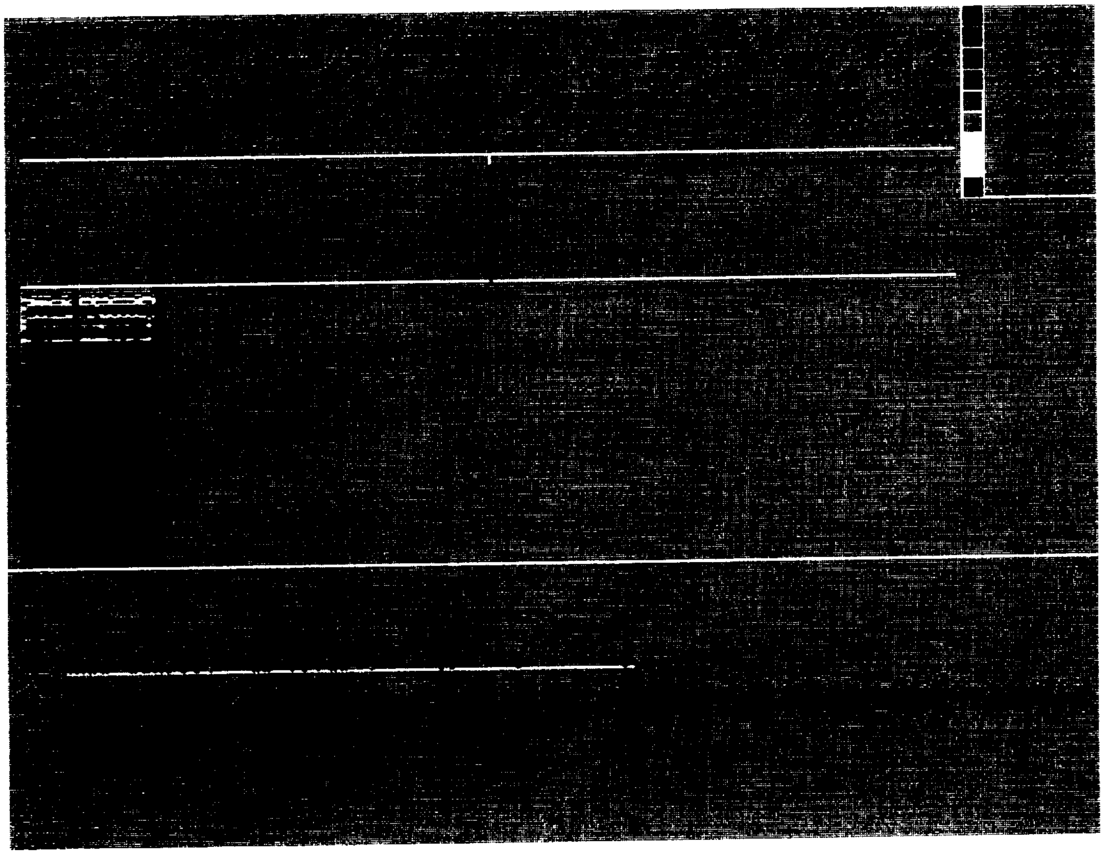
Setpwr1 Power shutdown at 4.0"y



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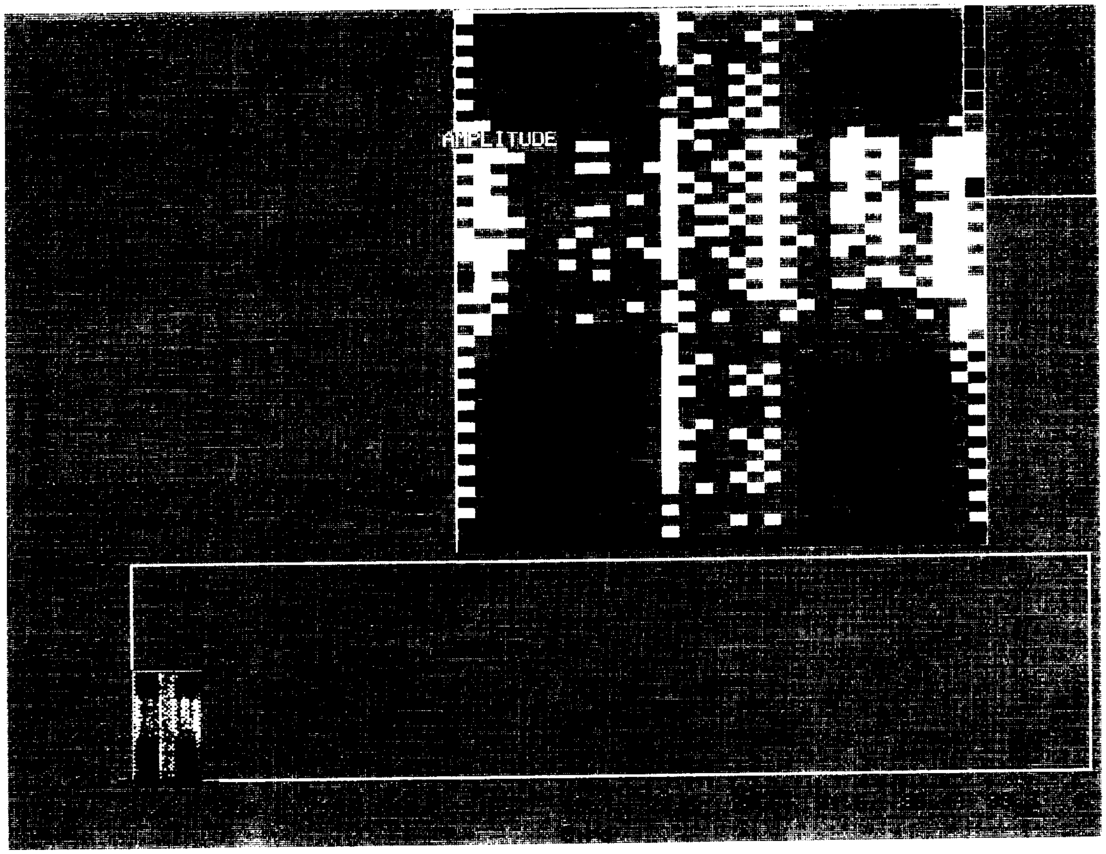
Setpwr II Power shutoff at 3.0"y



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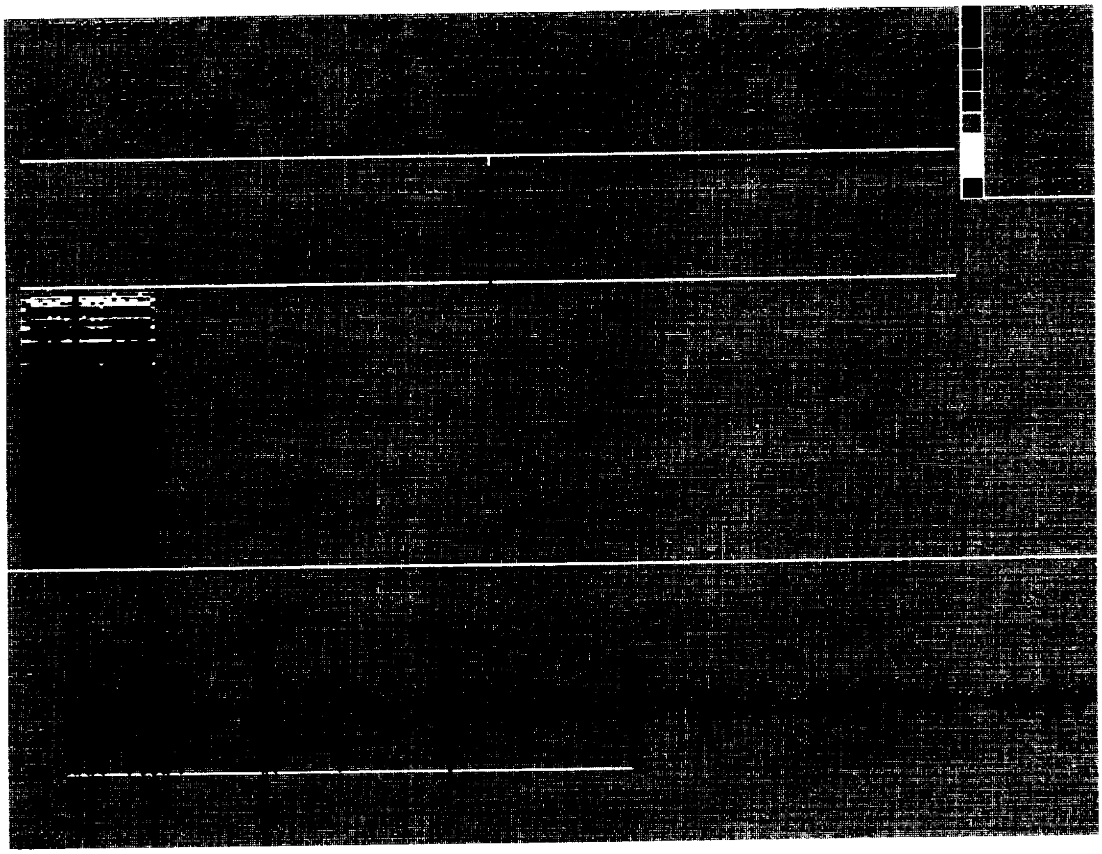
Setpwr II Power shutoff at 30" y



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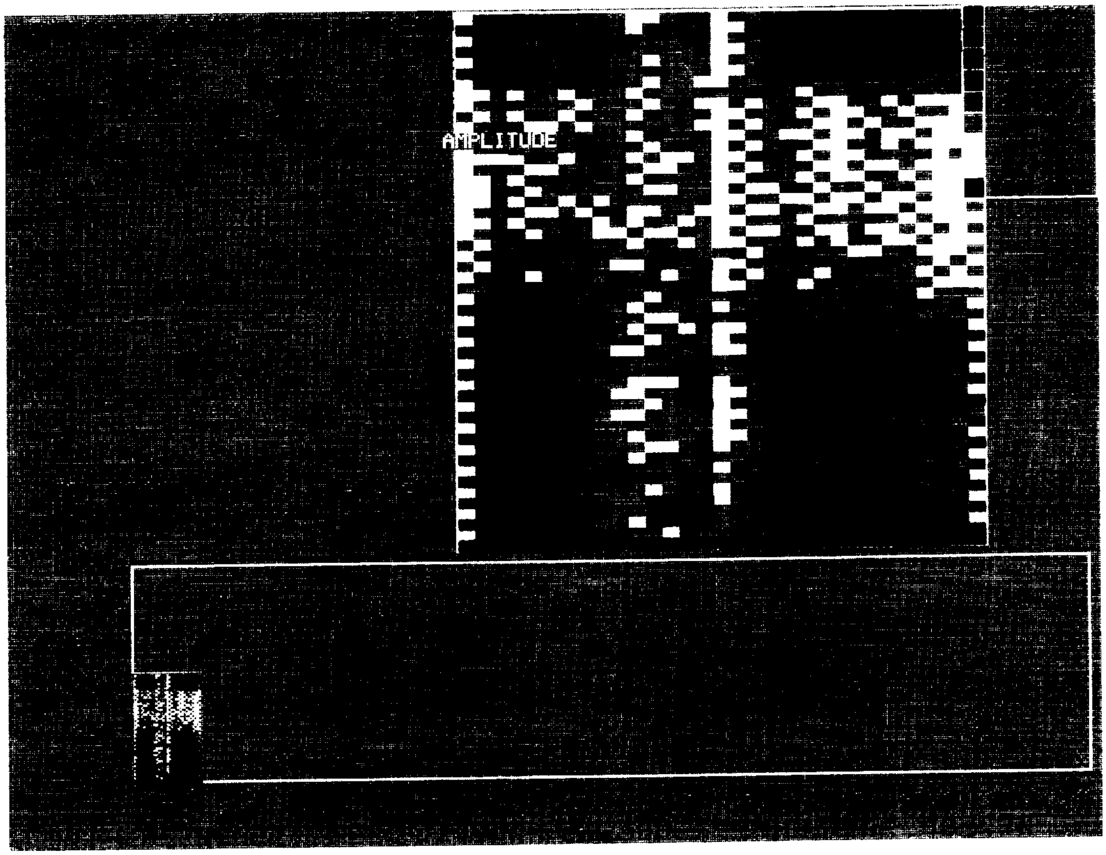
Setpwr III Power shutoutt at 20"y



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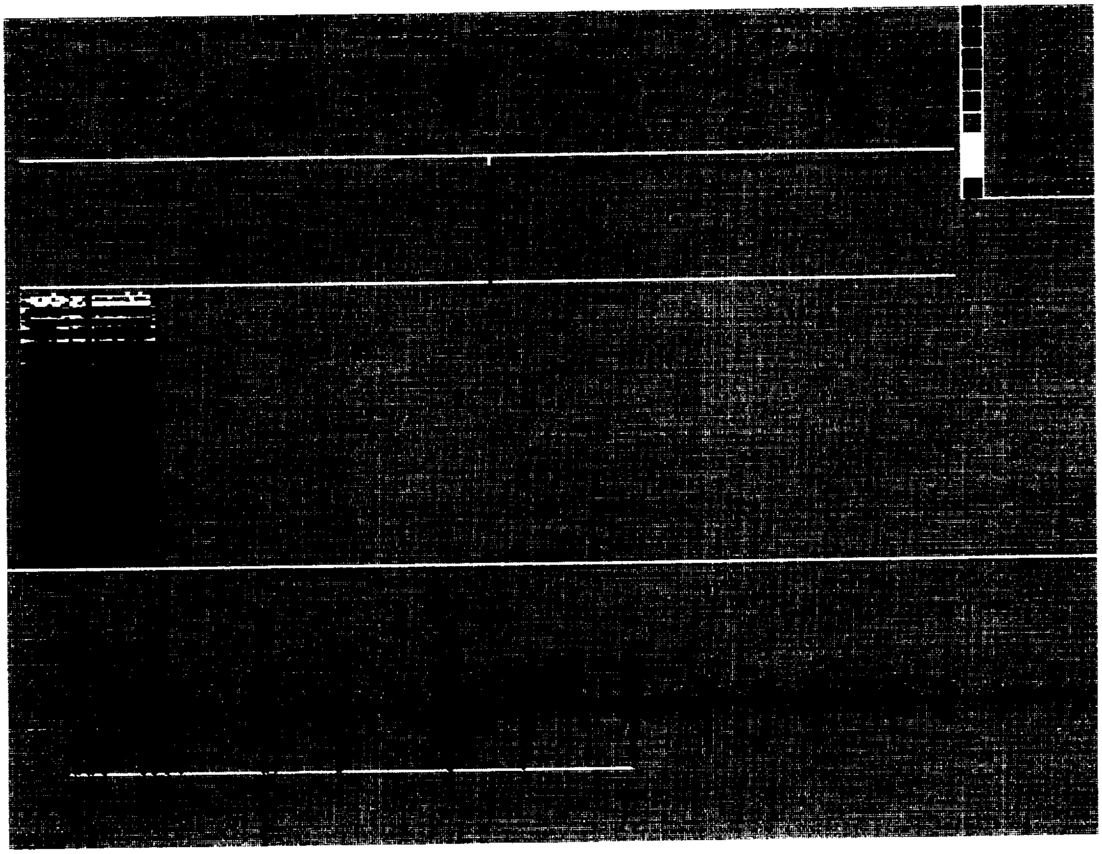
C 4

Jetpwr III Power shutoff at 20"y



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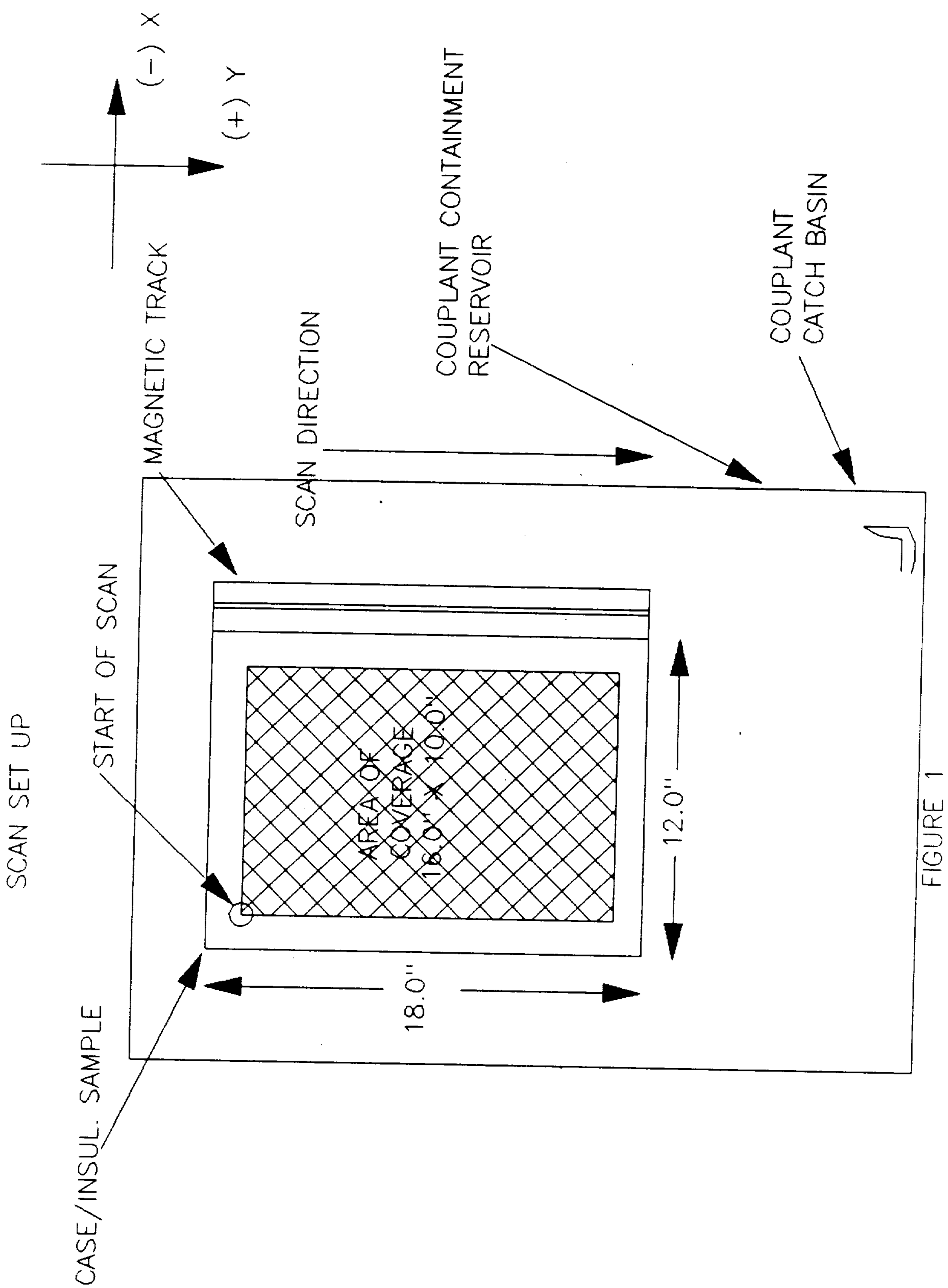

FIGURE 1

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B-242
B-243

UNINTERRUPTABLE POWER SUPPLY (UPS) VERIFICATION TEST

DATE: 21 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: J. Kerner

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA-51868

TOPAZ SERIAL NUMBER: SA 51868-9

TRANSDUCER SERIAL NUMBER: ~~SA 51868-9~~ T8353

1) COMPLETE THE CHECKLIST BEFORE PERFORMING THE TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED ...	BSC
c) TOPAZ UPS HAS BEEN SUFFICIENTLY CHARGED ...	BSC
***NOTE: IF THE TOPAZ HAS NOT BEEN CHARGED PROPERLY, THIS TEST WILL TERMINATE HERE UNTIL THE TOPAZ IS PROPERLY CHARGED.	
d) SYSTEM IS IN THE RF MODE	BSC
e) C-SCAN GATE DELAY IS AT ~~20.0~~ 22.9 MICROSECONDS	BSC
f) C-SCAN GATE WIDTH IS AT ~~30.0~~ 1.5 MICROSECONDS	BSC
g) FIGURE 1 OF THIS FORM HAS BEEN REVIEW AS SO A PROPER TEST CONFIGURATION IS ACHIEVED	BSC
h) OPERATOR IS FAMILIAR WITH AMDATA ENGINEERING SPECIFICATION 870128, SECTION 1.0, SUBSECTION "UNINTERRUPTABLE POWER SYSTEM (UPS) AND LINE FILTER"	BSC
i) SCAN WILL COVER A ~~16.0~~ 10.6 IN. AXIAL BY ~~10.0~~ 5.0 IN. CIRCUMFERENTIAL AREA	BSC

2) THERE WILL BE THREE RUNS OF THIS TEST, FILE NAMES WILL BE:

TEST RUN #	FILE NAME	
1	SETPWR1	~~Sr~~ Power shutdown at 4.0"
2	SETPWR2	power shutdown at 3.0"
3	SETPWR3	power shutdown at ~~2.0~~".5" data saved

3) BEGIN SCAN, ALLOW AT LEAST 5 PASSES OF THE TRANSDUCER OVER THE MEMBRANE SAMPLE BEFORE DISCONNECTING THE MAIN ELECTRICAL LINE.

4) COMPLETE EACH PART OF THIS CHART IN ACCORDANCE WITH THE TEST RUN NUMBER. ALSO PROVIDE A HARD COPY OF BOTH THE B AND C SCANS FROM EACH TEST RUN.

***NOTE: IF ANY ONE OF THE THREE TEST RUNS DOES NOT PRODUCE A DATA FILE WITH PROPERLY STORED A AND C SCANS, COMPLETE THE FOLLOWING:

a) CHECK ALL CONNECTIONS

b) CHECK ALL ENTRIES INTO THE SET FORMS

c) VERIFY THAT NONE OF THE UPS LIMITATIONS HAVE BEEN EXCEEDED PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 1.0, RE-PERFORM TEST.

d) IF PROBLEM STILL PERSISTS, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

(4 CONT.)

	TEST RUN NUMBER (CIRCLE YES OR NO) 1	2	3
PROPER DATA STORAGE ACHIEVED	YES NO	YES NO	YES NO
WAS DATA FILE ABLE TO BE RE ACCESSED	YES NO	YES NO	YES NO
WERE A AND C SCAN PRESENTATIONS COMPLETE	YES NO	YES NO	YES NO

REMARK ON ANY CORRECTIVE ACTIONS TAKEN TO RESOLVE PROBLEMS DURING ANY OF THE THREE TEST RUNS.

SeT Test (Setpwr1) power shuTdown at 4.0"

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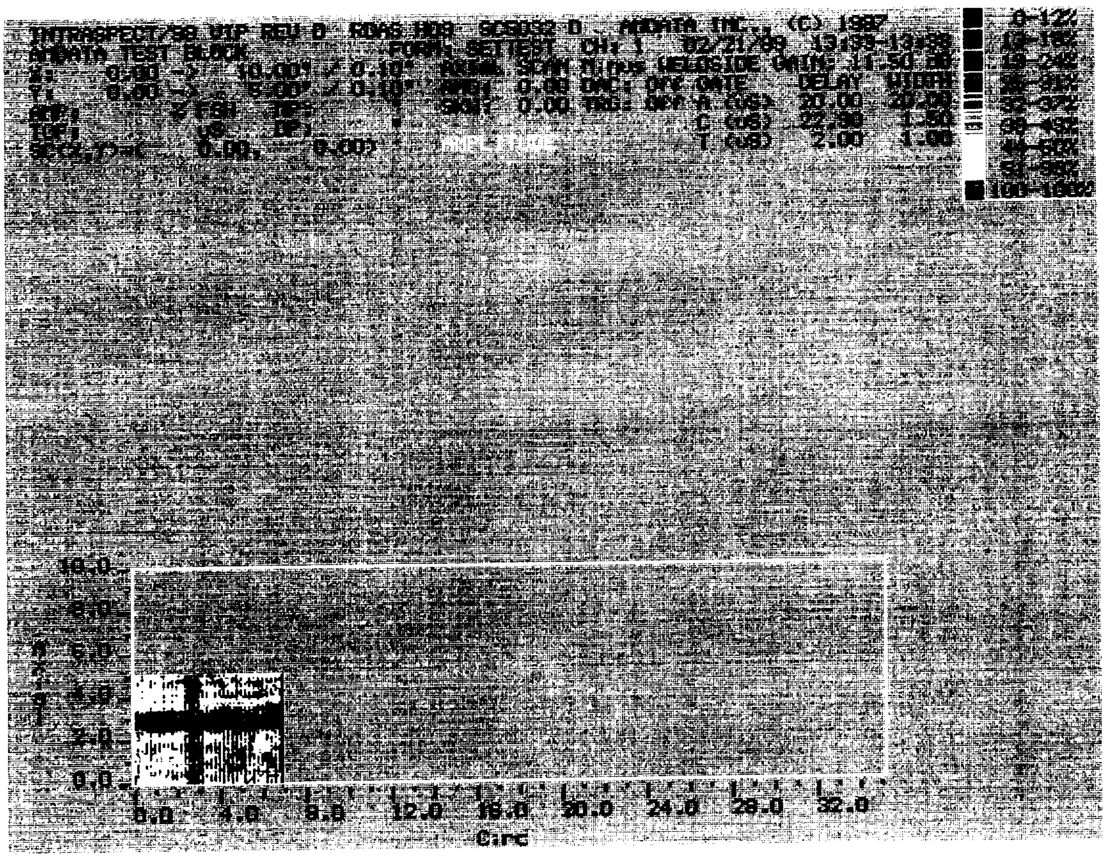

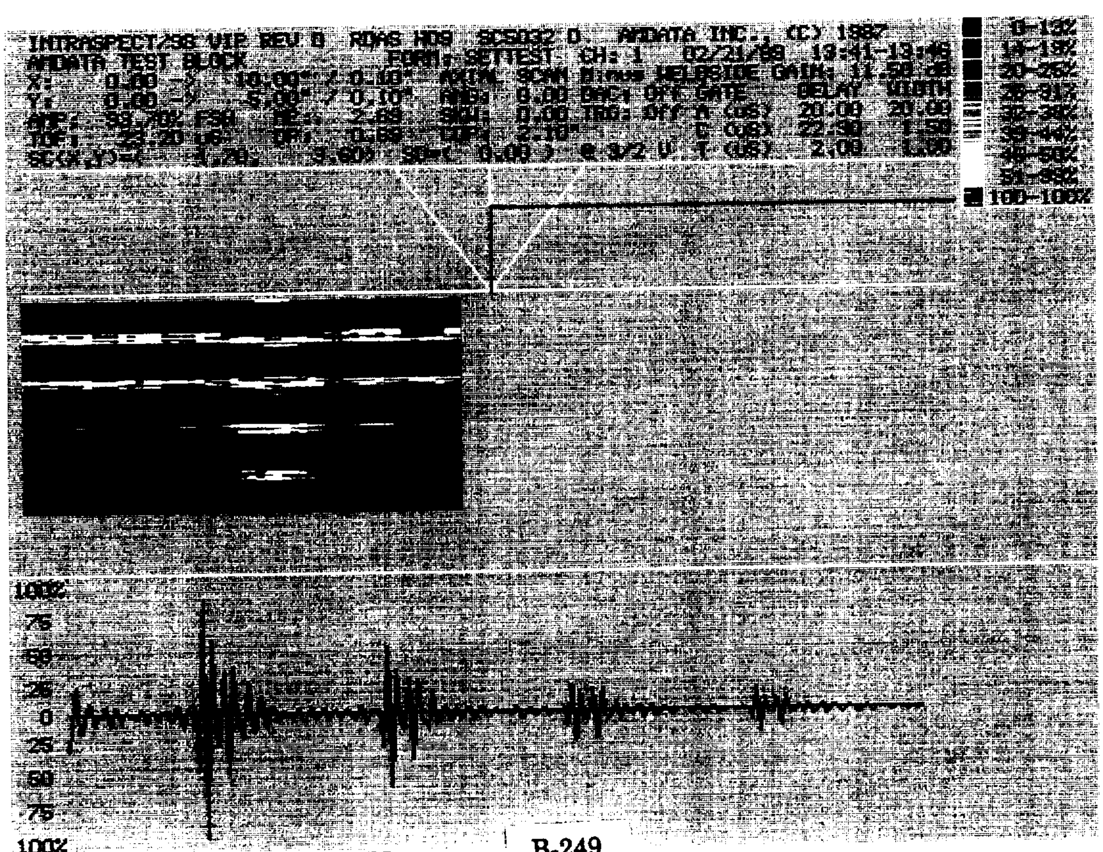

Set Test (SeTpwr 2) Power shuTdown aT 3.0"

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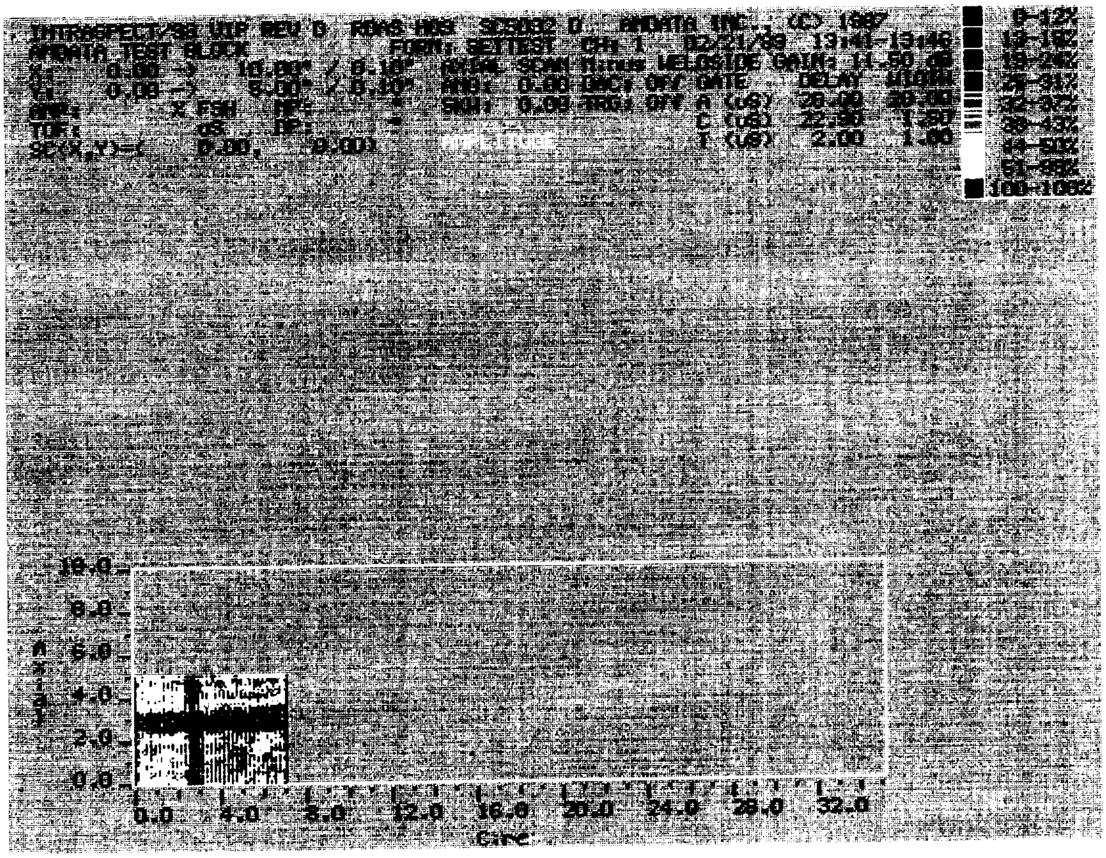

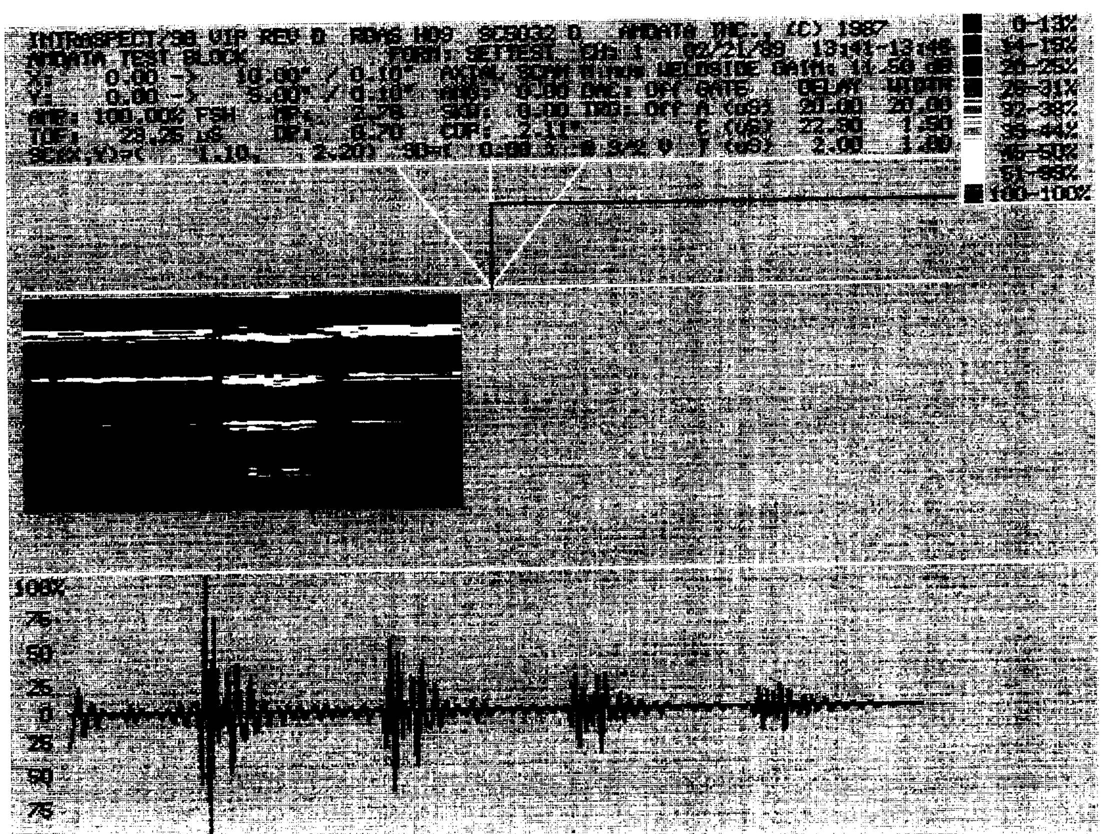

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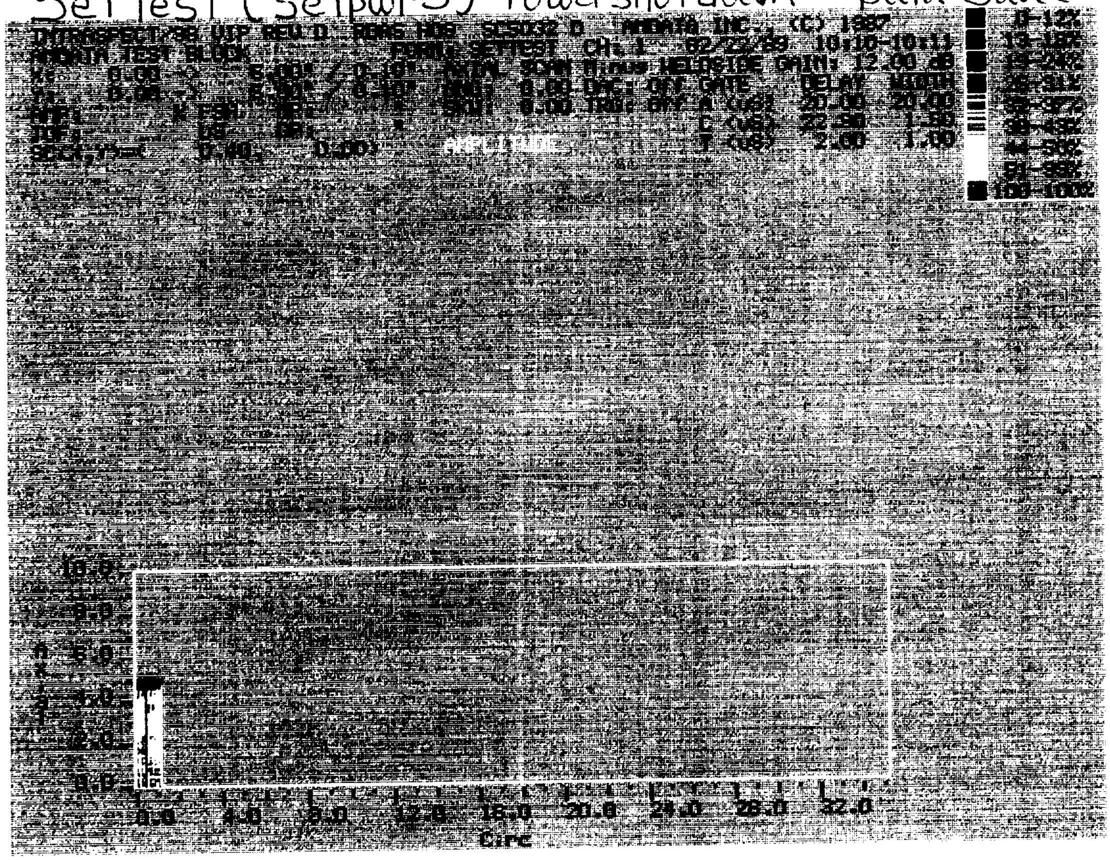
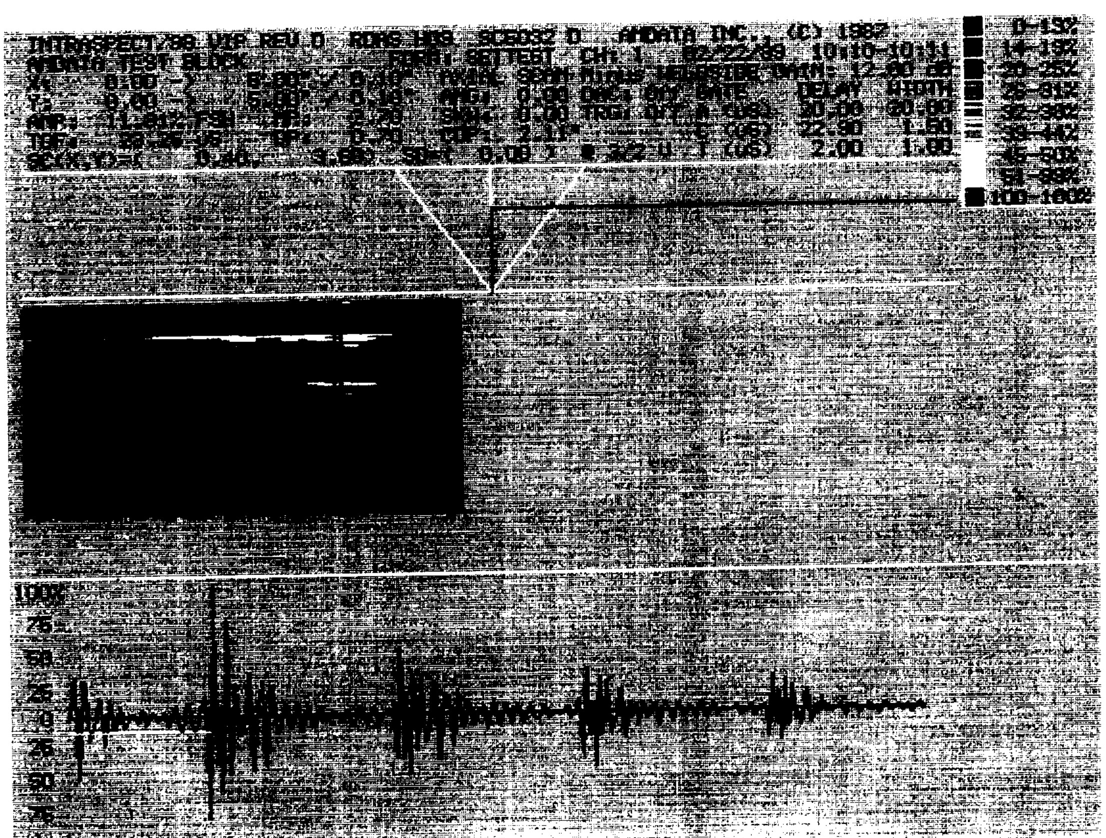
Settest (setpwr3) Powershutdown - Data Saved





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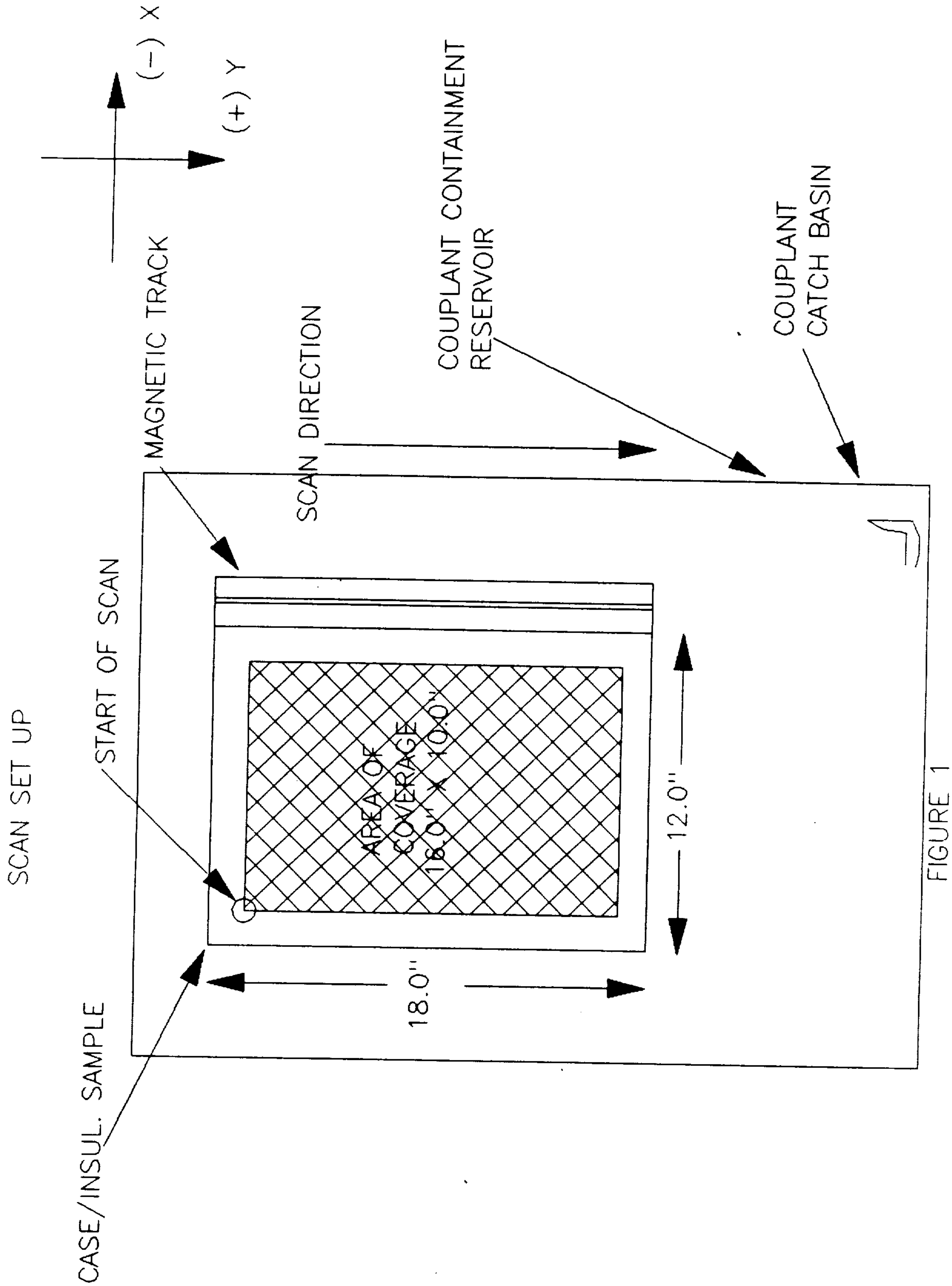

FIGURE 1

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B-254
B-255

2) THERE WILL BE THREE RUNS OF THIS TEST, FILE NAMES WILL BE:

TEST RUN #	FILE NAME
1	SETPWR1 power shutdown at 4.0"
2	SETPWR2 power shutdown at 3.0"
3	SETPWR3 power shutdown at .5" data saved

3) BEGIN SCAN, ALLOW AT LEAST 5 PASSES OF THE TRANSDUCER OVER THE MEMBRANE SAMPLE BEFORE DISCONNECTING THE MAIN ELECTRICAL LINE.

4) COMPLETE EACH PART OF THIS CHART IN ACCORDANCE WITH THE TEST RUN NUMBER. ALSO PROVIDE A HARD COPY OF BOTH THE B AND C SCANS FROM EACH TEST RUN.

***NOTE: IF ANY ONE OF THE THREE TEST RUNS DOES NOT PRODUCE A DATA FILE WITH PROPERLY STORED A AND C SCANS, COMPLETE THE FOLLOWING:

a) CHECK ALL CONNECTIONS

b) CHECK ALL ENTRIES INTO THE SET FORMS .

c) VERIFY THAT NONE OF THE UPS LIMITATIONS HAVE BEEN EXCEEDED PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 1.0, RE-PERFORM TEST.

d) IF PROBLEM STILL PERSISTS, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

(4 CONT.)

	TEST RUN NUMBER (CIRCLE YES OR NO)		
	1	2	3
PROPER DATA STORAGE ACHIEVED	YES NO	YES NO	YES NO
WAS DATA FILE ABLE TO BE RE ACCESSED	YES NO	YES NO	YES NO
WERE A AND C SCAN PRESENTATIONS COMPLETE	YES NO	YES NO	YES NO

REMARK ON ANY CORRECTIVE ACTIONS TAKEN TO RESOLVE PROBLEMS DURING ANY OF THE THREE TEST RUNS. ______________________

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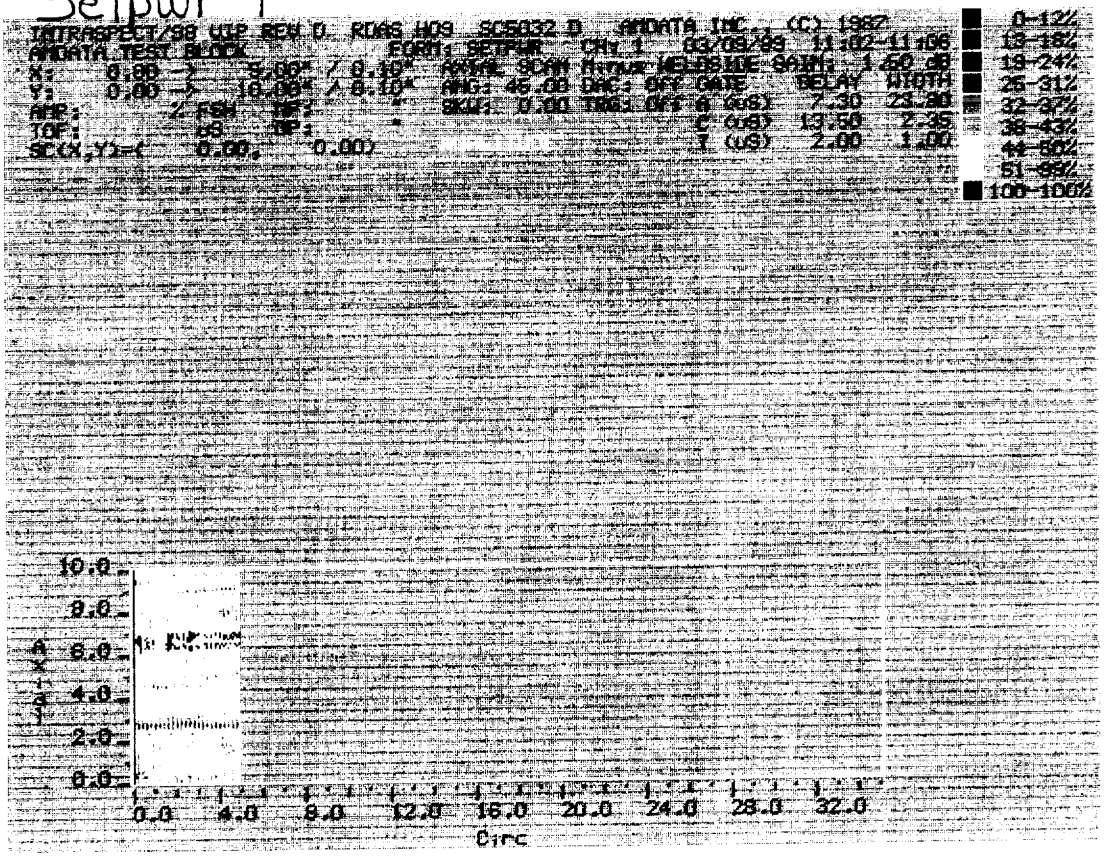
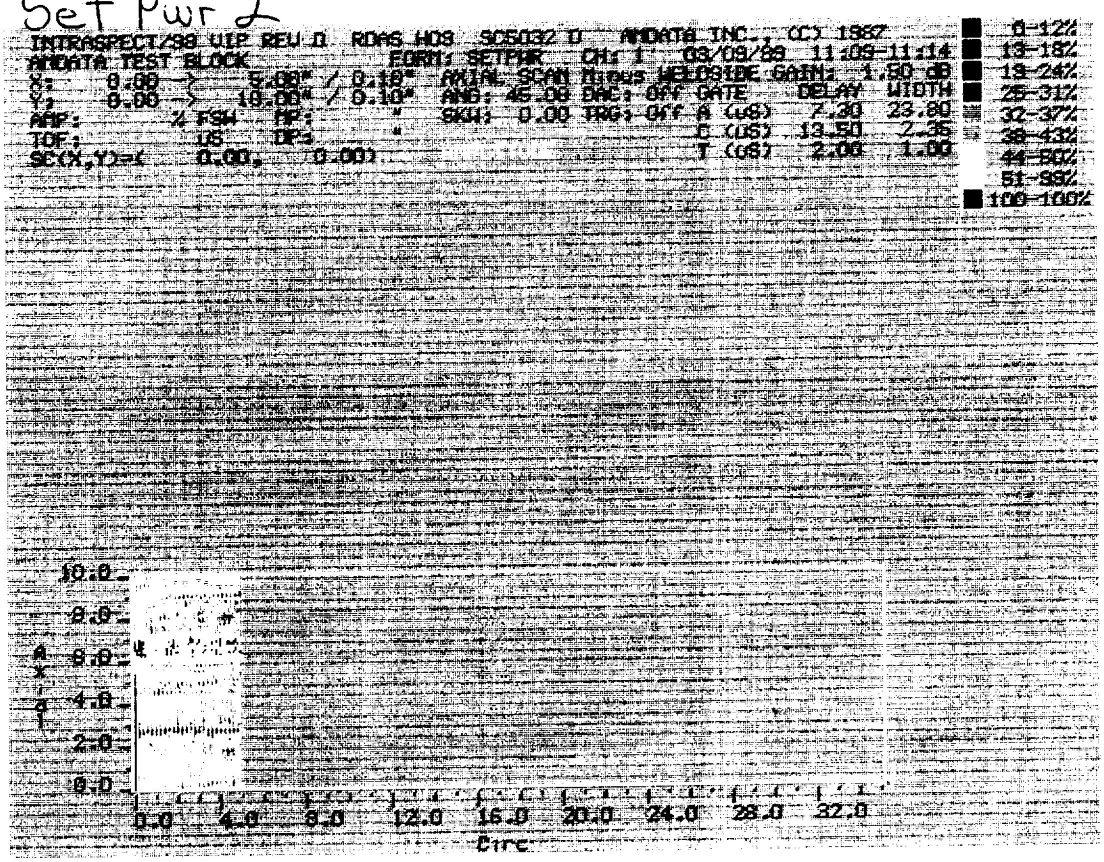
Setpwr 1



Set Pwr 2



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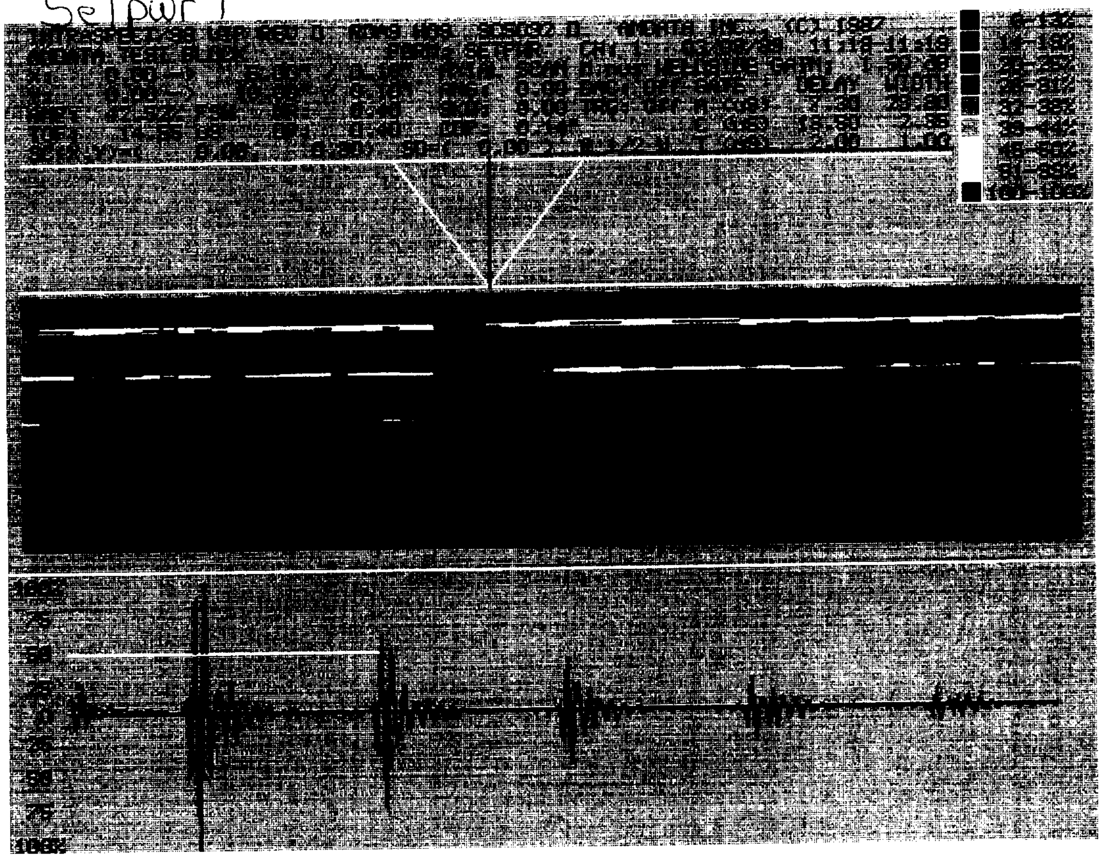
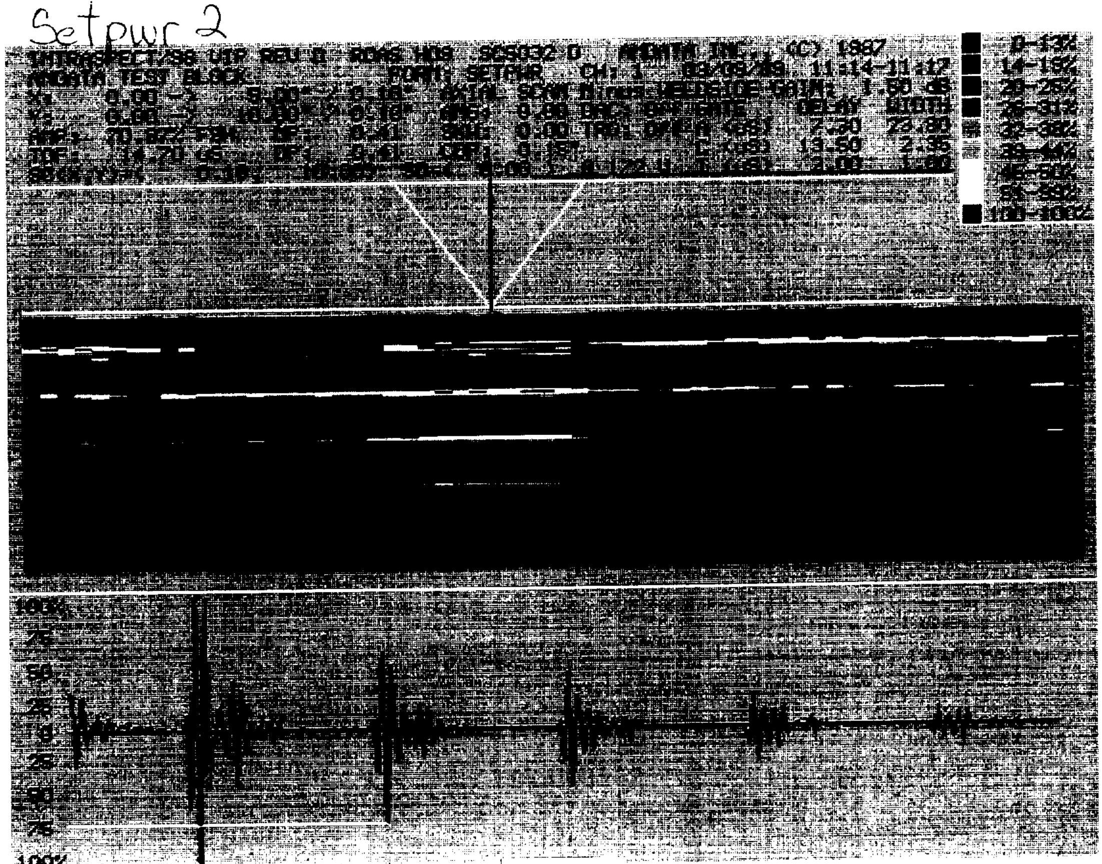
Setpwr 1



Setpwr 2



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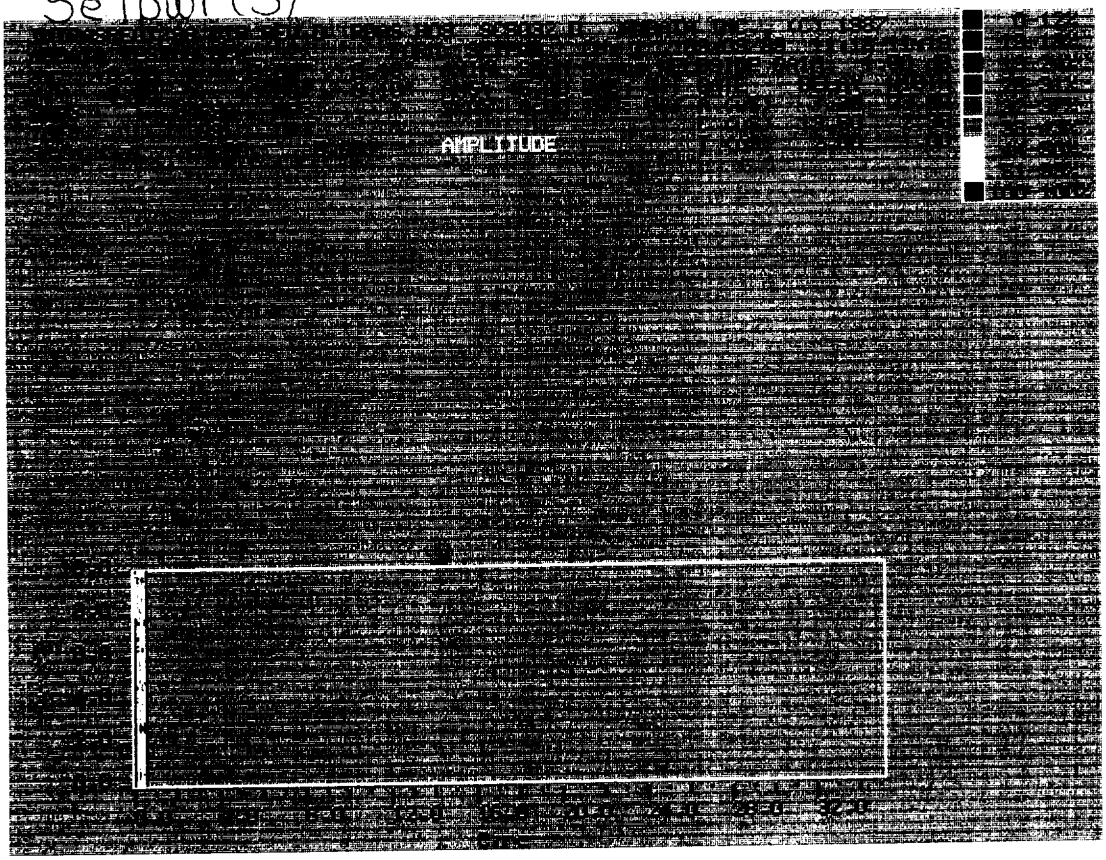
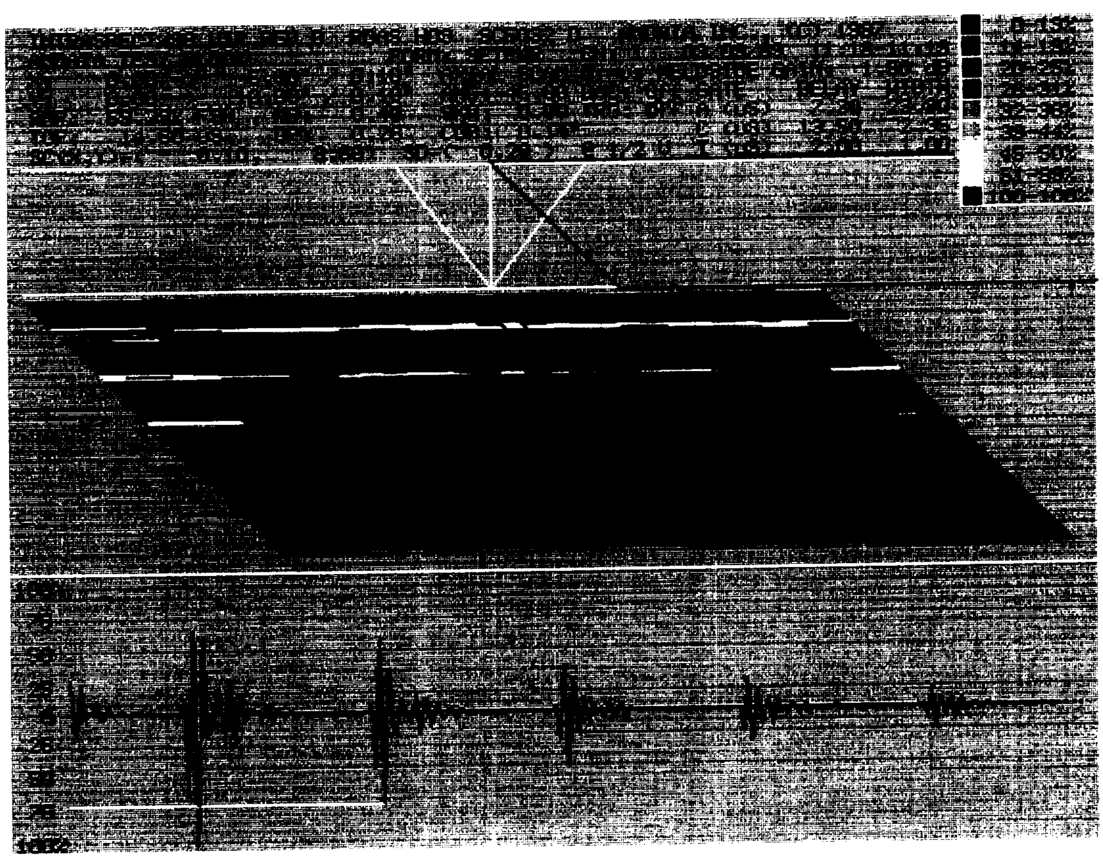
SeTowr(3)





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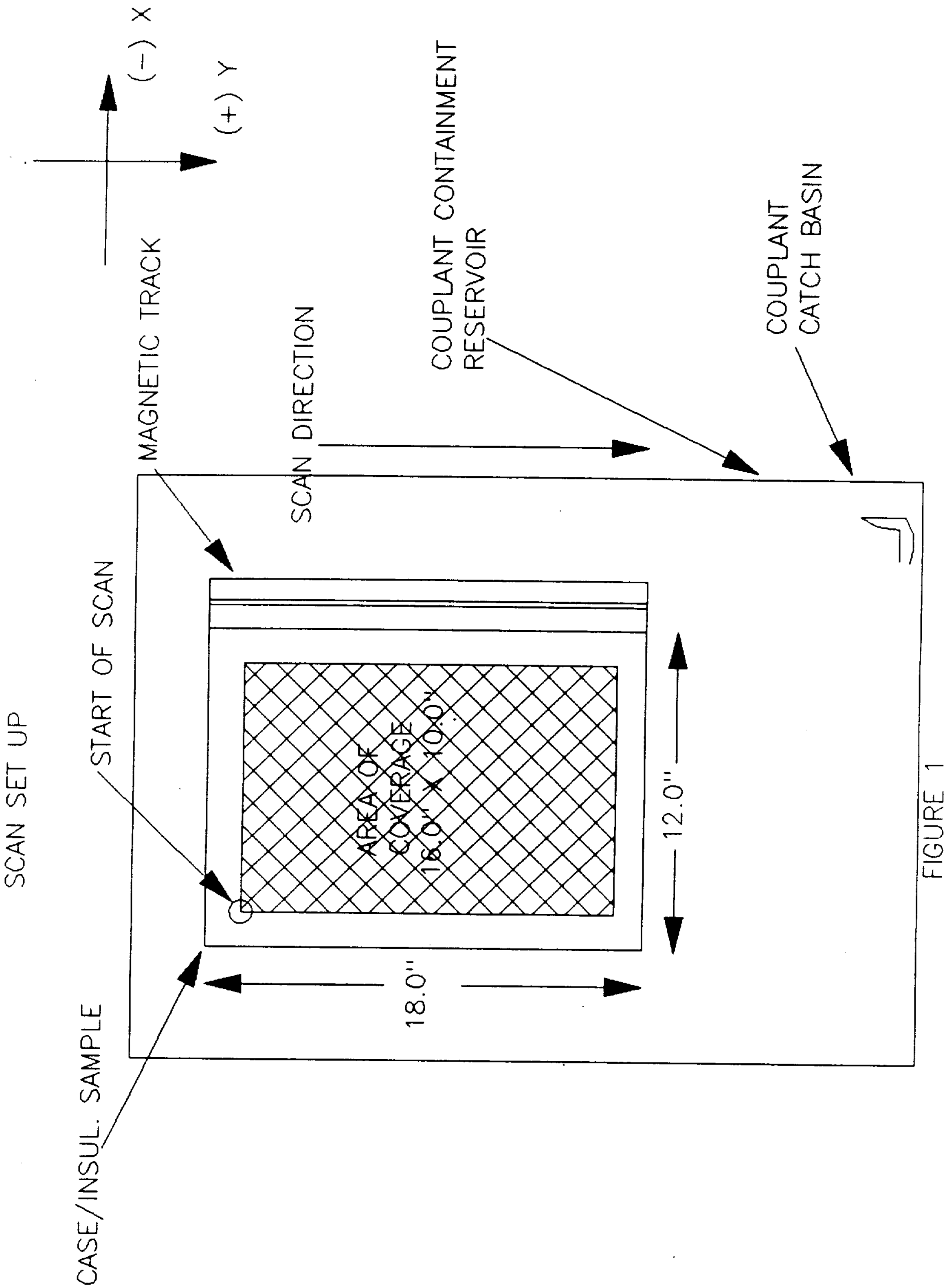

SCAN SET UP

FIGURE 1

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B-264
B-265

UNINTERUPTABLE POWER SUPPLY VERIFICATION TEST

DATE: 26 May 89

OPERATOR: Brad Cushing

VERIFIED BY: [signature] 5/26/89

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51869

TOPAZ SERIAL NUMBER: SA51869

TRANSDUCER SERIAL NUMBER: RND-3

1) COMPLETE THE CHECK LIST BEFORE PERFORMING THE TEST.

	COMPLETED
O 5.0 MHz TRANSDUCER IS BEING USED	BSC
O 10.0" LONG SCANNER ARM IS BEING USED	BSC
O TOPAZ UNINTERUPTABLE POWER SUPPLY HAS BEEN SUFFICIENTLY CHARGED ***NOTE: IF THE TOPAZ HAS NOT BEEN CHARGED PROPERLY, THIS TEST WILL TERMINATE HERE UNTIL THE TOPAZ IS PROPERLY CHARGED.	BSC
O SYSTEM IS IN THE RF MODE	BSC
O C-SCAN GATE DELAY IS AT ~~20.0~~ ~~46.0~~ 43.65 MICROSECONDS	
O C-SCAN GATE WIDTH IS AT ~~30.0~~ ~~3.75~~ 4.0 MICROSECONDS	
O FIGURE 1 OF THIS FORM HAS BEEN REVIEW AS SO A PROPER TEST CONFIGURATION IS ACHIEVED	BSC
O OPERATOR IS FAMILIAR WITH AMDATA ENGINEERING SPECIFICATION 870128, SECTION 1.0, SUB SECTION "UNINTERUPTABLE POWER SYSTEM (UPS) AND LINE FILTER.	
O SCAN WILL COVER A ~~16.0"~~ 5.0" AXIAL BY ~~10.0"~~ 8.0 CIRCUMFERENTIAL AREA	

2) THERE WILL BE THREE RUNS OF THIS TEST, FILE NAMES WILL BE:

TEST RUN #	FILE NAME
1	SETPWR1 - Data Saved
2	SETPWR2 - Data Saved
3	SETPWR3 - Data Saved

3) BEGIN SCAN, ALLOW AT LEAST 5 PASSES OF THE TRANSDUCER OVER THE MEMBRANE SAMPLE BEFORE DISCONNECTING THE MAIN ELECTRICAL LINE.

4) COMPLETE EACH PART OF THIS CHART IN ACCORDANCE WITH THE TEST RUN NUMBER. ALSO PROVIDE A HARD COPY OF BOTH THE B AND C SCANS FROM EACH TEST RUN.

***NOTE: IF ANY ONE OF THE THREE TEST RUNS DOES NOT PRODUCE A DATA FILE WITH PROPERLY STORED A AND C SCANS, COMPLETE THE FOLLOWING:

a) CHECK ALL CONNECTIONS

b) CHECK ALL ENTRIES INTO THE SET FORMS

c) VERIFY THAT NONE OF THE UPS LIMITATIONS HAVE BEEN EXCEEDED PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 1.0, RE-PERFORM TEST.

d) IF PROBLEM STILL PERSISTS, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

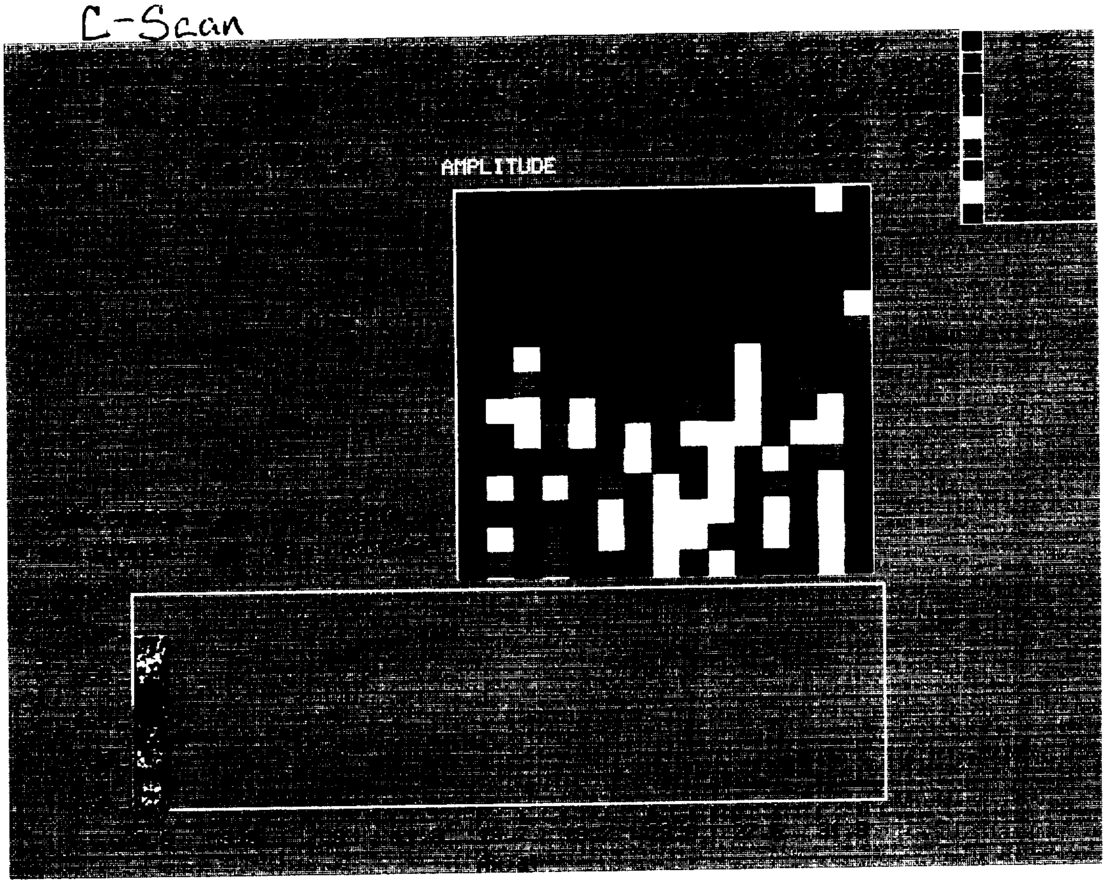
(4 CONT.)

	TEST RUN NUMBER (CIRCLE YES OR NO) 1	2	3
PROPER DATA STORAGE ACHIEVED	YES NO	YES NO	YES NO
WAS DATA FILE ABLE TO BE RE ACCESSED	YES NO	YES NO	YES NO
WERE A AND C SCAN PRESENTATIONS COMPLETE	YES NO	YES NO	YES NO

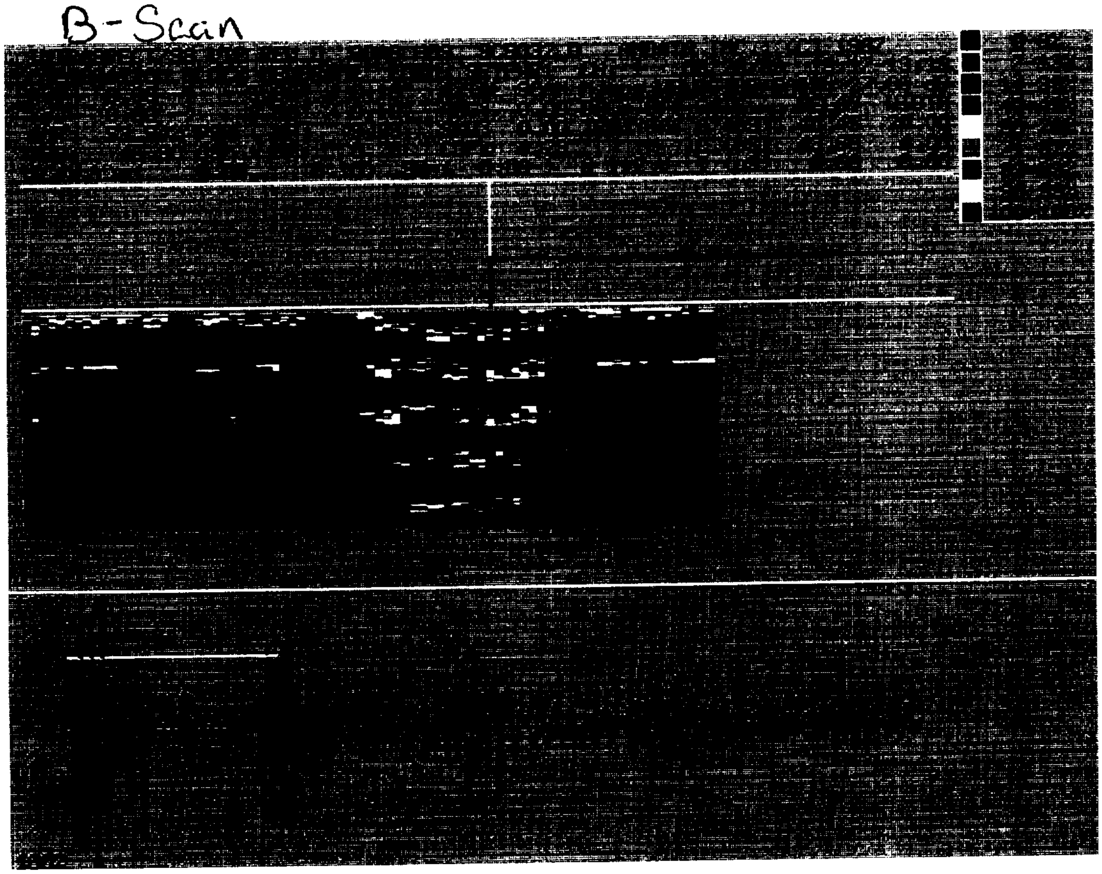
REMARK ON ANY CORRECTIVE ACTIONS TAKEN TO RESOLVE PROBLEMS DURING ANY OF THE THREE TEST RUNS. ______

U.P.S Verification Setpwr 1

C-Scan



B-Scan



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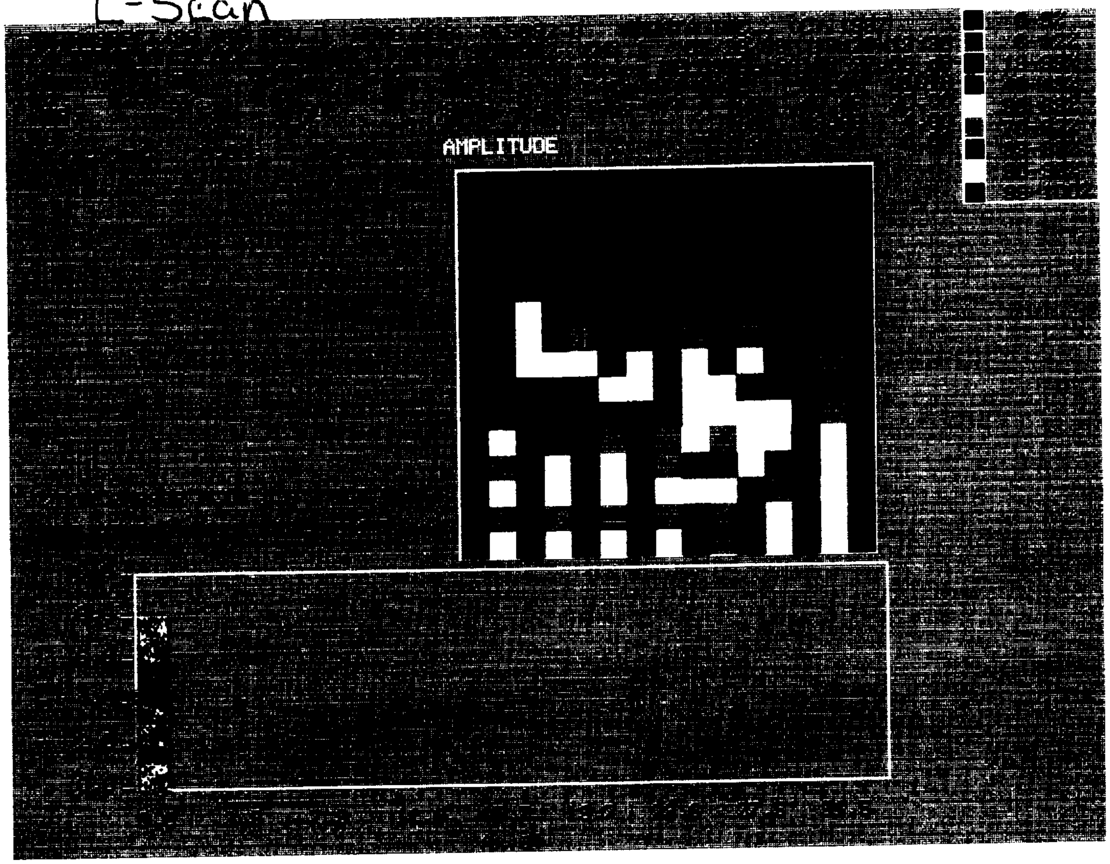
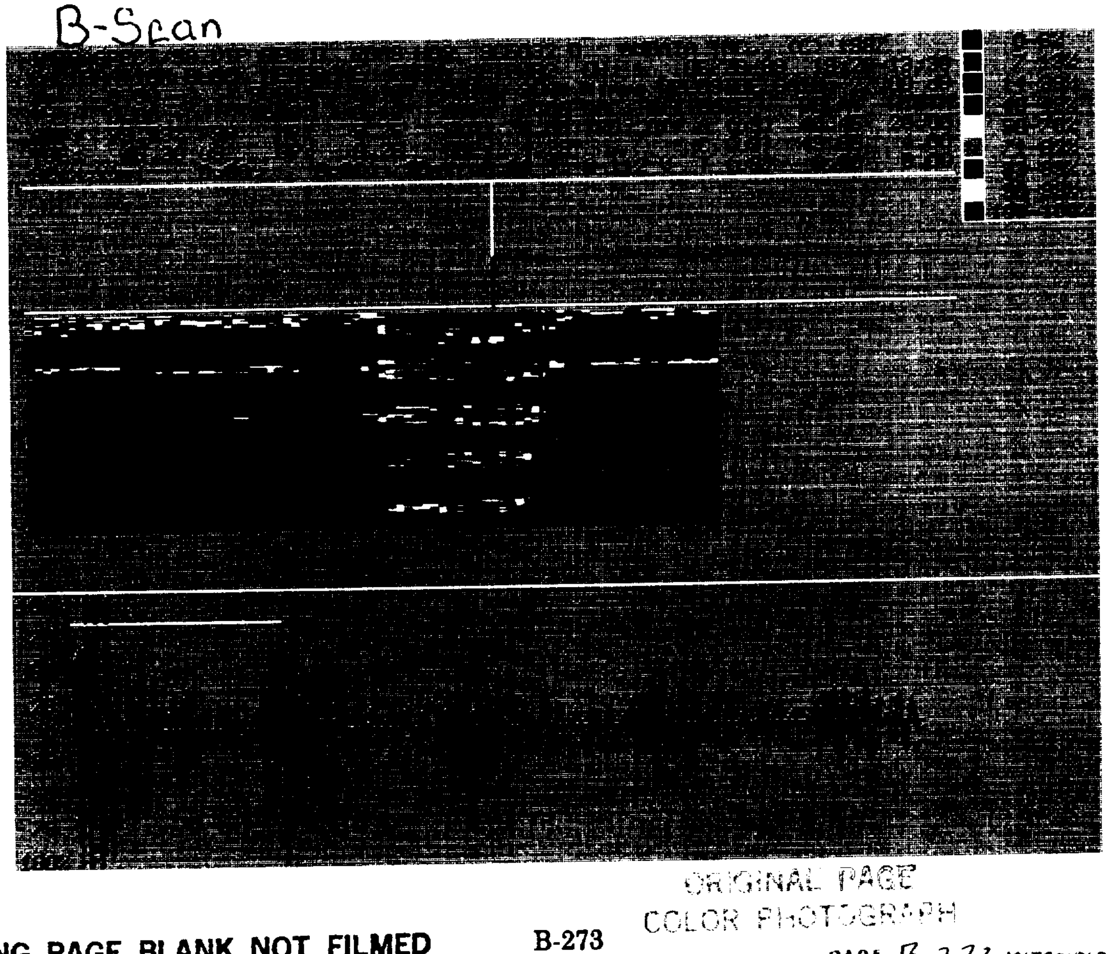
U.P.S Verification Setpwr 2

C-Scan



B-Scan



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U.P.S Verification Setpwr3

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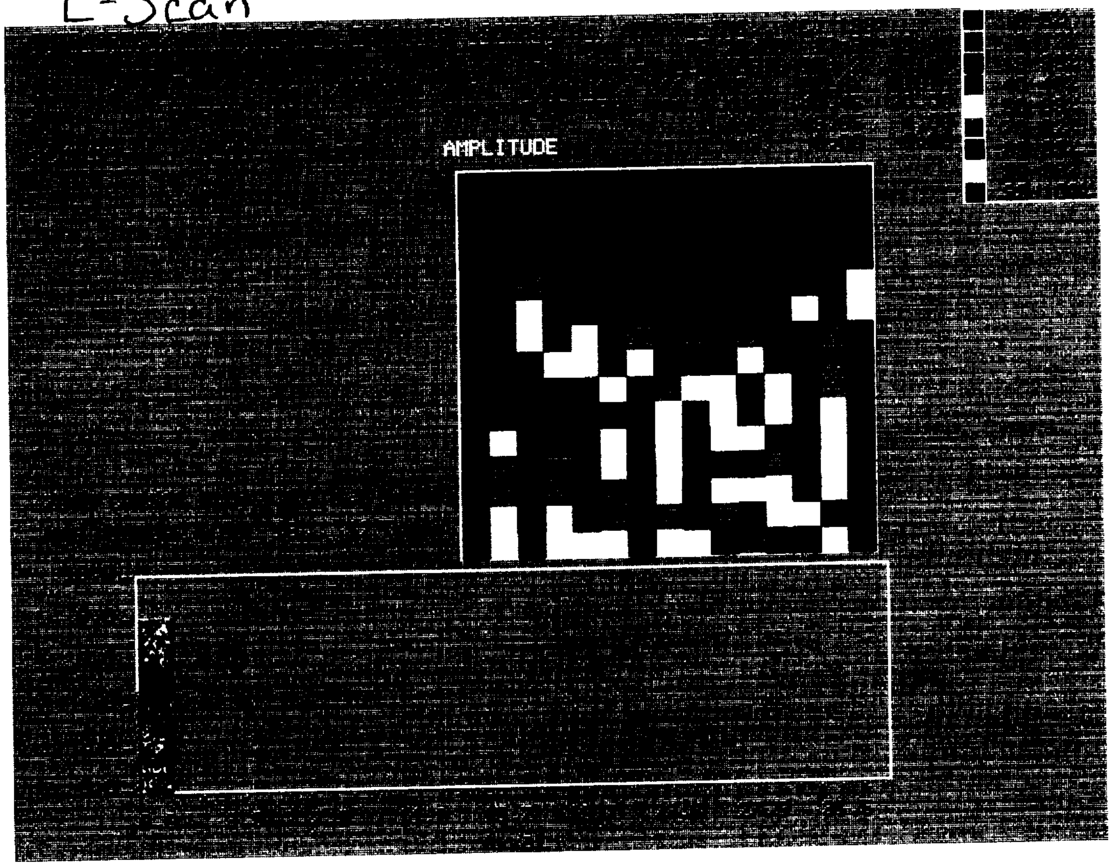
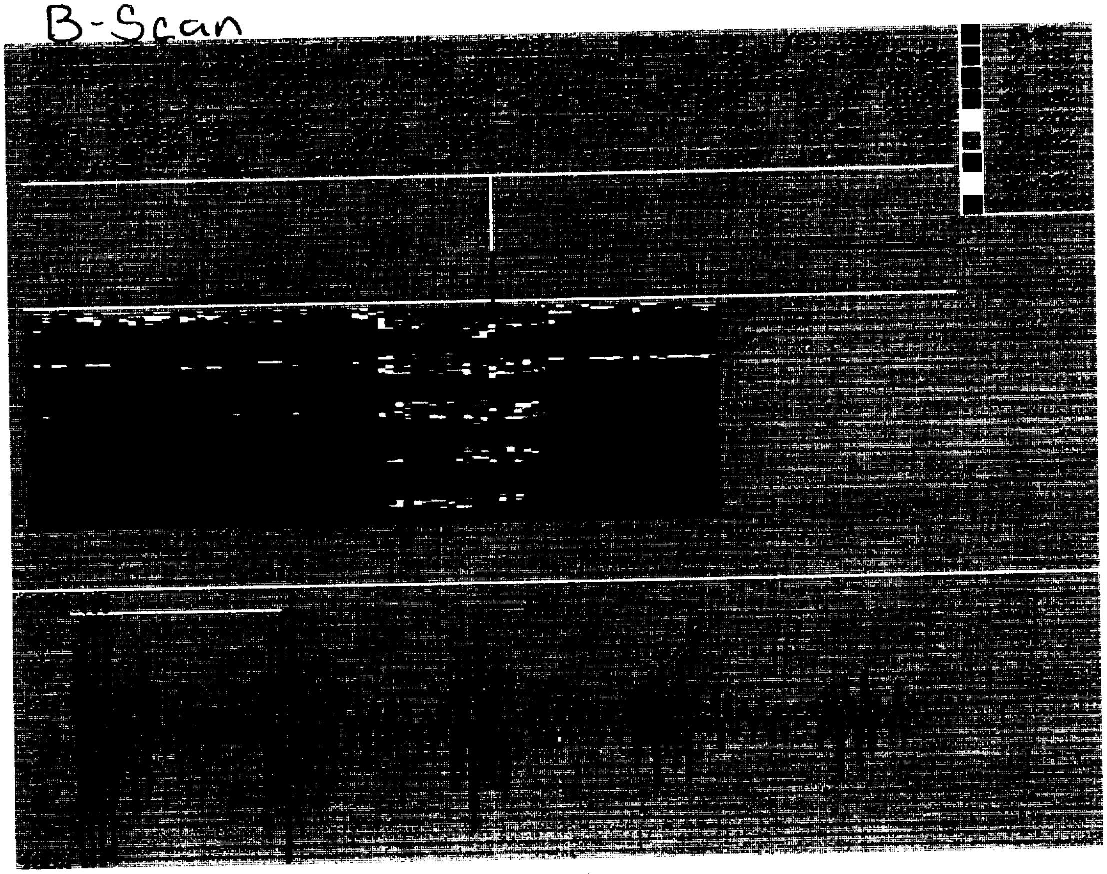


B-Scan



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SCAN SET UP

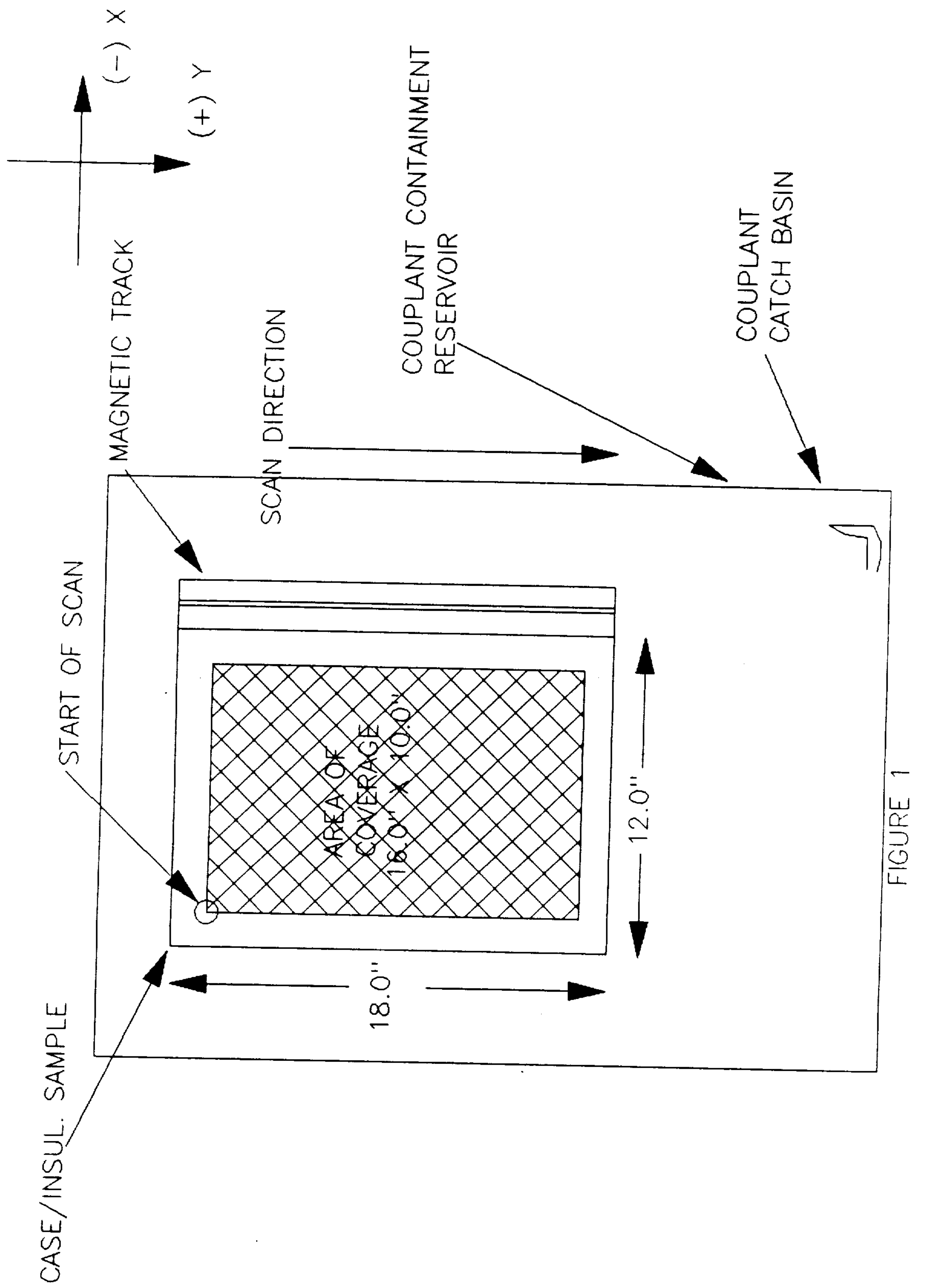

FIGURE 1

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B-276
B-277

CRT DISPLAY AND HARD COPY
VERIFICATION TESTS

DATE: 13 Feb 89

OPERATOR: B Cushing

VERIFIED BY: [illegible]

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51866

PRINTER SERIAL NUMBER: SA51866-7

TRANSDUCER SERIAL NUMBER: T8359

SECTION 1:

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	[illegible]
b) 10.0 IN. LONG SCANNER ARM IS BEING USED ...	[illegible]
c) SAMPLING INCREMENT IS ~~0.25~~ ~~0.10~~ 0.10 IN.	[illegible] BJC
d) SYSTEM IS IN RF MODE	[illegible]
e) A-SCAN GATE DELAY 9.0 MICROSECONDS	[illegible]
f) A-SCAN GATE WIDTH 51.0 MICROSECONDS	[illegible]
g) C-SCAN GATE DELAY IS 20.0 MICROSECONDS	[illegible]
h) C-SCAN GATE WIDTH IS ~~30.0~~ 3.75 MICROSECONDS	[illegible] BJC
i) COLOR PALETTE IN THE MASTER FORM HAS BEEN SET UP IN ACCORDANCE WITH AMDATA ENGINEERING SPECIFICATION NUMBER 870128, PAGE 73, "COLOR PALETTE".	BJC
j) SCAN WILL COVER AN AREA THAT IS 16.0 IN. AXIALLY BY 10.0 IN. CIRCUMFERENTIALLY.	[illegible]

2) PERFORM SCAN.

3) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, RETURN TO THE MASTER FORM AND CHECK THE NUMBERS ENTERED INTO THE COLOR PALETTE FORM.

4) RE-PERFORM SCAN.

5) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________

____

____

____

____

____

SECTION 2:

1) RECALL THE SCREEN PRESENTATION FROM SECTION 1 OF THIS FORM AND MAKE A HARD COPY OF IT ON THE HEWLETT/PACKARD PAINTJET PRINTER.

2) COMPARE THE HARD COPY TO THE SCREEN PRESENTATION TO VERIFY THAT THE SAME COLOR LEGEND APPEARS AND THE ALL THE CHARACTERS ARE SHARPLY DEFINED AND EASY TO READ.

IF THE HARD COPY PRESENTATION MATCHES THE SCREEN PRESENTATION, ATTACH THE HARD COPY TO THIS FORM AND PROCEED TO DATA FILE INTEGRITY VERIFICATION TEST.

IF THE TWO PRESENTATIONS DON'T MATCH IN EITHER COLOR OR CLARITY, CHECK ALL CONNECTIONS, VERIFY THAT THE PRINTER IS CONFIGURED PROPERLY.

3) RE-PERFORM TEST.

4) DID THE TWO PRESENTATIONS MATCH?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, ATTACH THE HARD COPY TO THIS FORM, AND PROCEED TO THE DATA FILE INTEGRITY VERIFICATION TEST.

IF NO, COMPLETE A PROBLEM FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN, ATTACH THE HARD COPY TO THIS FORM AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ____
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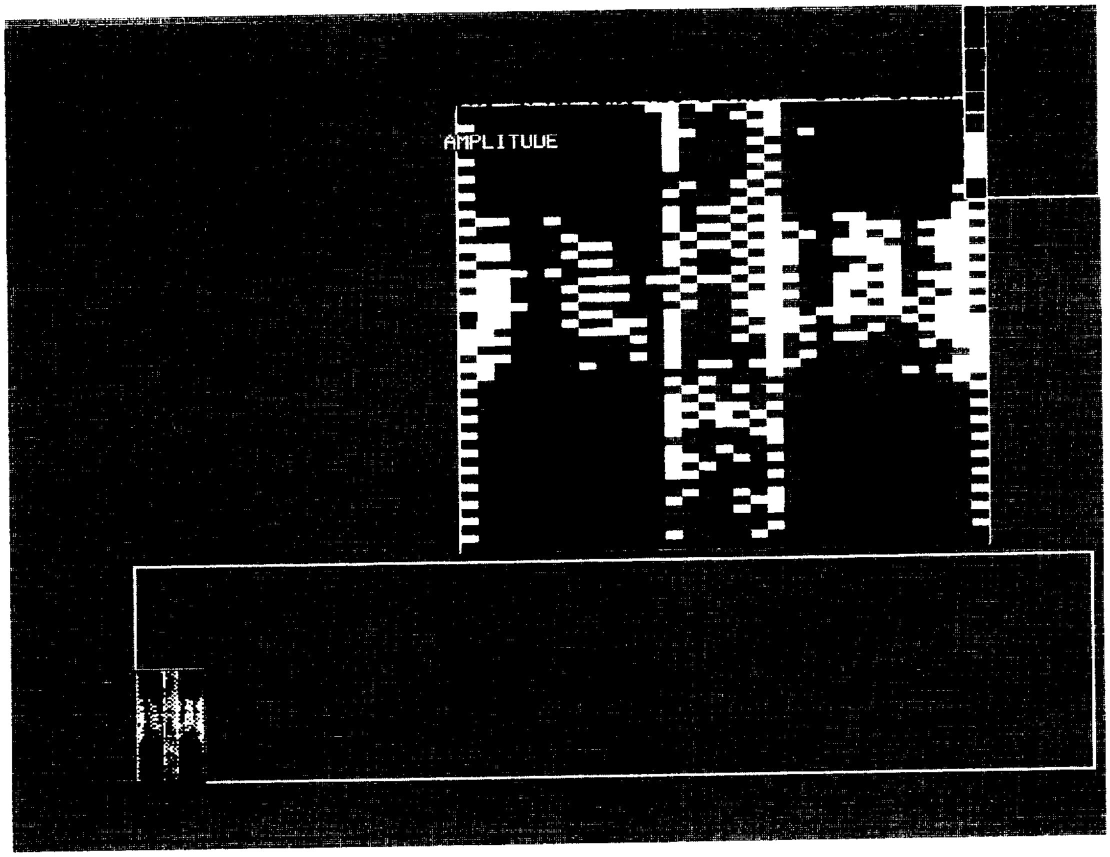
ORIGINAL PAGE
COLOR PHOTOGRAPH



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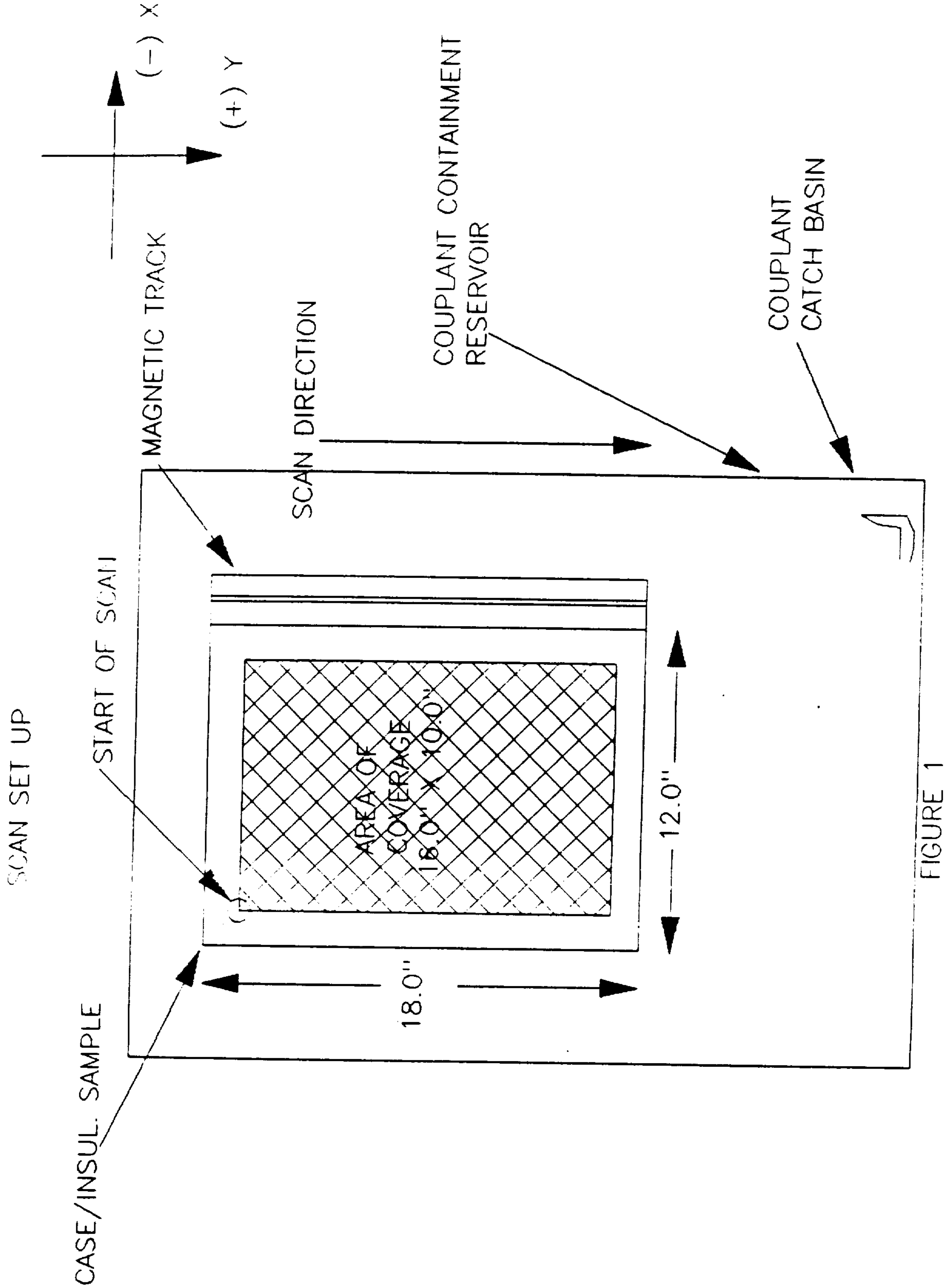

FIGURE 1

B-284, B-285

CRT DISPLAY AND HARD COPY VERIFICATION TESTS

DATE: 22 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: J. Karnes

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51868

PRINTER SERIAL NUMBER: SA-51866-7

TRANSDUCER SERIAL NUMBER: T8353

SECTION 1:

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED ...	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) SYSTEM IS IN RF MODE	BSC
e) A-SCAN GATE DELAY ~~9.0~~ 20.0 MICROSECONDS	BSC
f) A-SCAN GATE WIDTH ~~51.0~~ 20.0 MICROSECONDS	BSC
g) C-SCAN GATE DELAY IS ~~20.0~~ 22.9 MICROSECONDS	BSC
h) C-SCAN GATE WIDTH IS ~~30.0~~ 1.65 MICROSECONDS	BSC
i) COLOR PALETTE IN THE MASTER FORM HAS BEEN SET UP IN ACCORDANCE WITH AMDATA ENGINEERING SPECIFICATION NUMBER 870128, PAGE 73, "COLOR PALETTE".	BSC
j) SCAN WILL COVER AN AREA THAT IS ~~16.0~~ 8.0 IN. AXIALLY BY ~~10.0~~ 5.0 IN. CIRCUMFERENTIALLY.	BSC

2) PERFORM SCAN.

3) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, RETURN TO THE MASTER FORM AND CHECK THE NUMBERS ENTERED INTO THE COLOR PALETTE FORM.

4) RE-PERFORM SCAN.

5) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________
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SECTION 2:

1) RECALL THE SCREEN PRESENTATION FROM SECTION 1 OF THIS FORM AND MAKE A HARD COPY OF IT ON THE HEWLETT/PACKARD PAINTJET PRINTER.

2) COMPARE THE HARD COPY TO THE SCREEN PRESENTATION TO VERIFY THAT THE SAME COLOR LEGEND APPEARS AND THE ALL THE CHARACTERS ARE SHARPLY DEFINED AND EASY TO READ.

IF THE HARD COPY PRESENTATION MATCHES THE SCREEN PRESENTATION, ATTACH THE HARD COPY TO THIS FORM AND PROCEED TO DATA FILE INTEGRITY VERIFICATION TEST.

IF THE TWO PRESENTATIONS DON'T MATCH IN EITHER COLOR OR CLARITY, CHECK ALL CONNECTIONS, VERIFY THAT THE PRINTER IS CONFIGURED PROPERLY.

3) RE-PERFORM TEST.

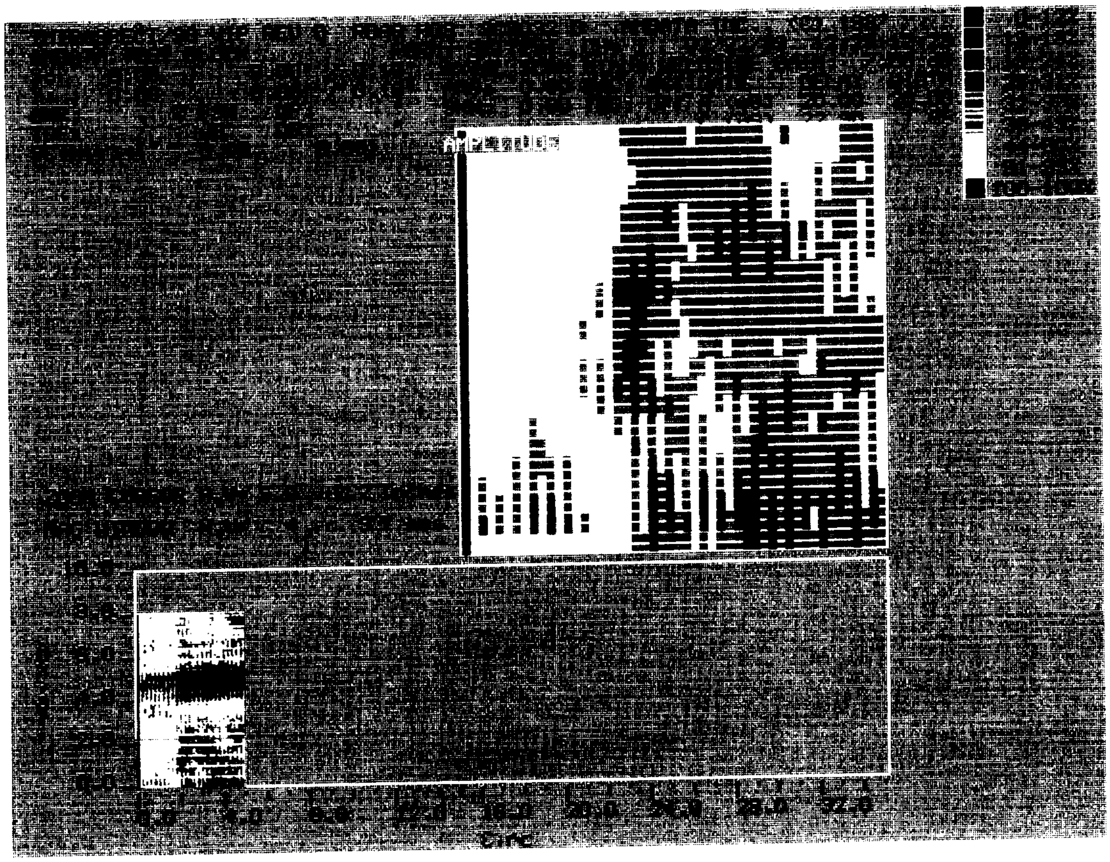
4) DID THE TWO PRESENTATIONS MATCH?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, ATTACH THE HARD COPY TO THIS FORM, AND PROCEED TO THE DATA FILE INTEGRITY VERIFICATION TEST.

IF NO, COMPLETE A PROBLEM FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN, ATTACH THE HARD COPY TO THIS FORM AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________



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PAGE B-290 INTENTIONALLY BLANK

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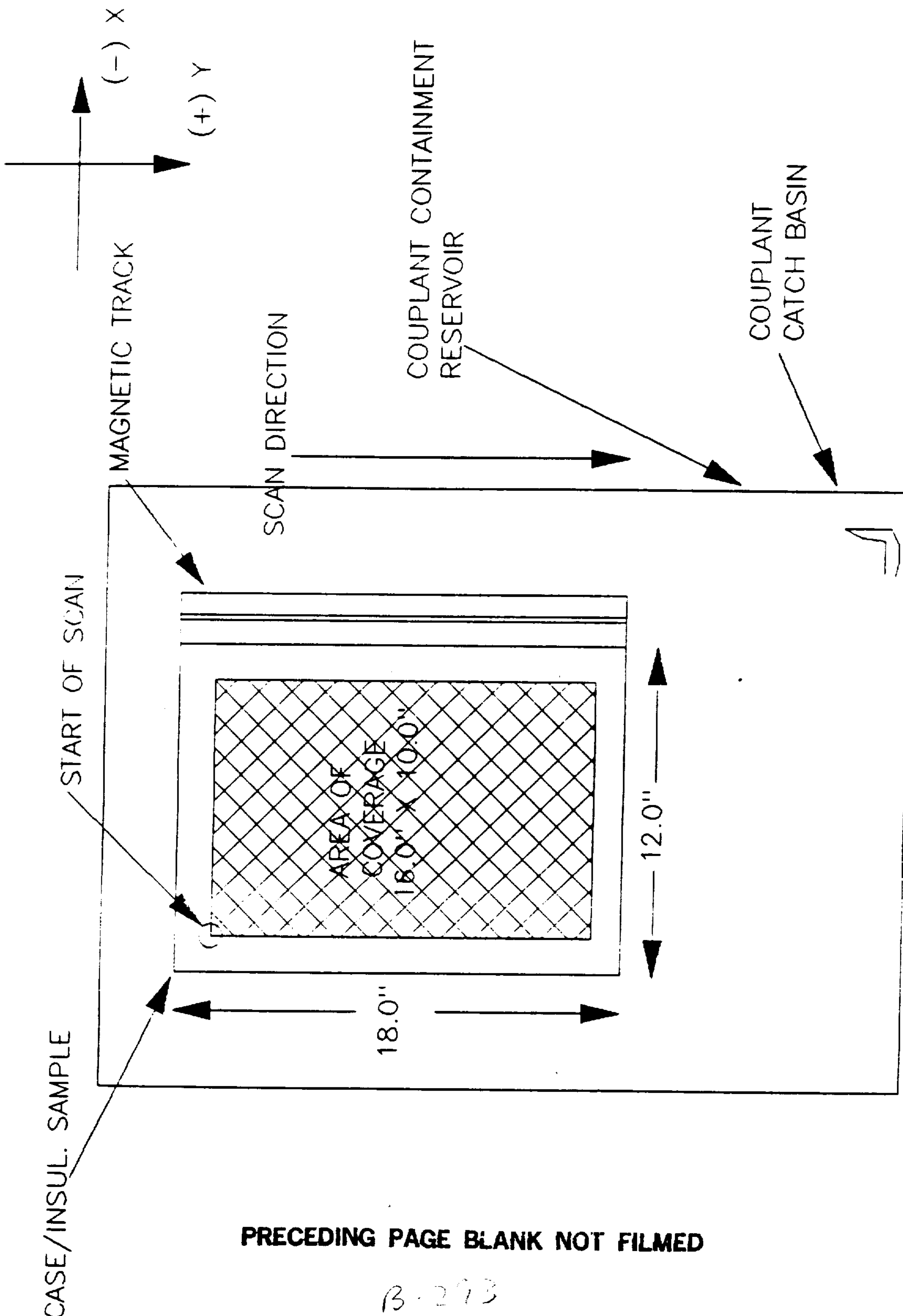

SCAN SET UP

FIGURE 1

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B-293
B-294

CRT DISPLAY AND HARD COPY VERIFICATION TESTS

DATE: 9 March 89

OPERATOR: Brad Cushing

VERIFIED BY:

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51865

PRINTER SERIAL NUMBER: SA51866

TRANSDUCER SERIAL NUMBER: RD-3

SECTION 1:

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED ...	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) SYSTEM IS IN RF MODE	BSC
e) A-SCAN GATE DELAY ~~9.0~~ 7.3 MICROSECONDS	BSC
f) A-SCAN GATE WIDTH ~~51.0~~ 23.8 MICROSECONDS	BSC
g) C-SCAN GATE DELAY IS ~~20.0~~ 13.5 MICROSECONDS	BSC
h) C-SCAN GATE WIDTH IS ~~30.0~~ 2.35 MICROSECONDS	BSC
i) COLOR PALETTE IN THE MASTER FORM HAS BEEN SET UP IN ACCORDANCE WITH AMDATA ENGINEERING SPECIFICATION NUMBER 870128, PAGE 73, "COLOR PALETTE".	BSC
j) SCAN WILL COVER AN AREA THAT IS ~~16.0~~ 10.0 IN. AXIALLY BY ~~10.0~~ 5.0 IN. CIRCUMFERENTIALLY.	BSC

2) PERFORM SCAN.

3) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, RETURN TO THE MASTER FORM AND CHECK THE NUMBERS ENTERED INTO THE COLOR PALETTE FORM.

4) RE-PERFORM SCAN.

5) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ____

SECTION 2:

1) RECALL THE SCREEN PRESENTATION FROM SECTION 1 OF THIS FORM AND MAKE A HARD COPY OF IT ON THE HEWLETT/PACKARD PAINTJET PRINTER.

2) COMPARE THE HARD COPY TO THE SCREEN PRESENTATION TO VERIFY THAT THE SAME COLOR LEGEND APPEARS AND THE ALL THE CHARACTERS ARE SHARPLY DEFINED AND EASY TO READ.

IF THE HARD COPY PRESENTATION MATCHES THE SCREEN PRESENTATION, ATTACH THE HARD COPY TO THIS FORM AND PROCEED TO DATA FILE INTEGRITY VERIFICATION TEST.

IF THE TWO PRESENTATIONS DON'T MATCH IN EITHER COLOR OR CLARITY, CHECK ALL CONNECTIONS, VERIFY THAT THE PRINTER IS CONFIGURED PROPERLY.

3) RE-PERFORM TEST.

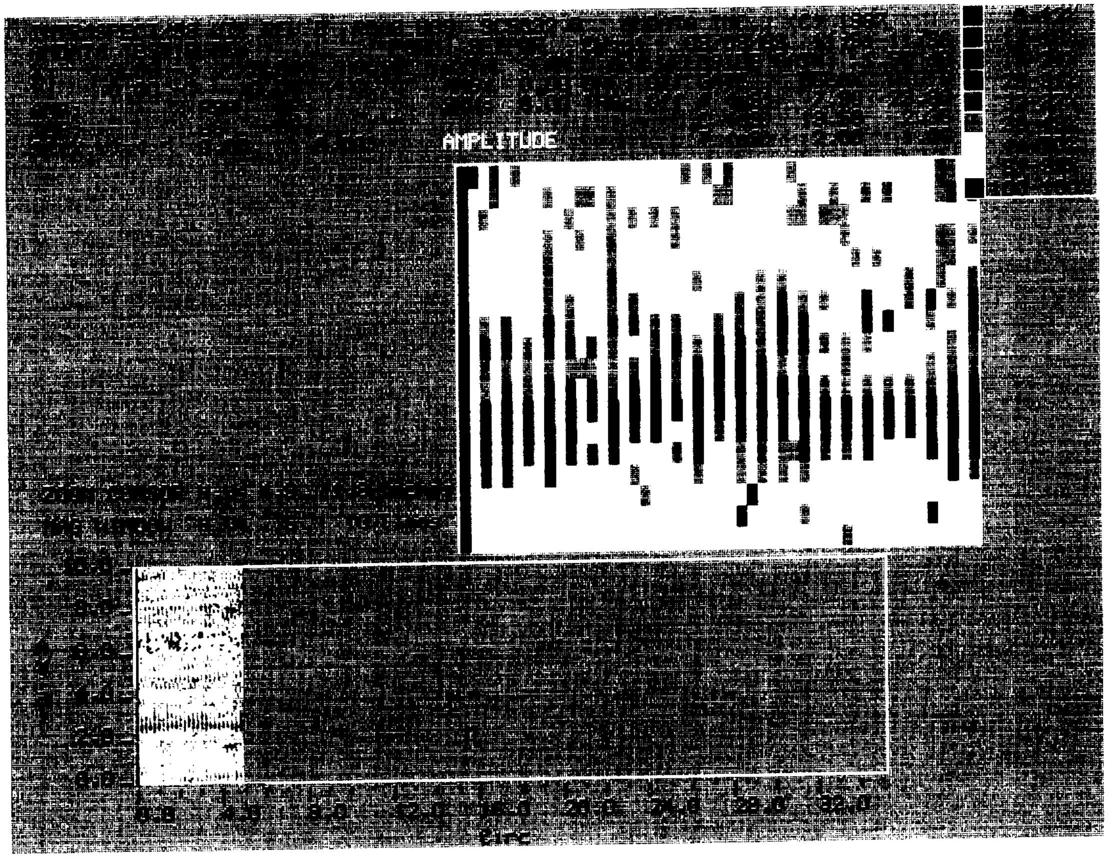
4) DID THE TWO PRESENTATIONS MATCH?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, ATTACH THE HARD COPY TO THIS FORM, AND PROCEED TO THE DATA FILE INTEGRITY VERIFICATION TEST.

IF NO, COMPLETE A PROBLEM FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN, ATTACH THE HARD COPY TO THIS FORM AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________



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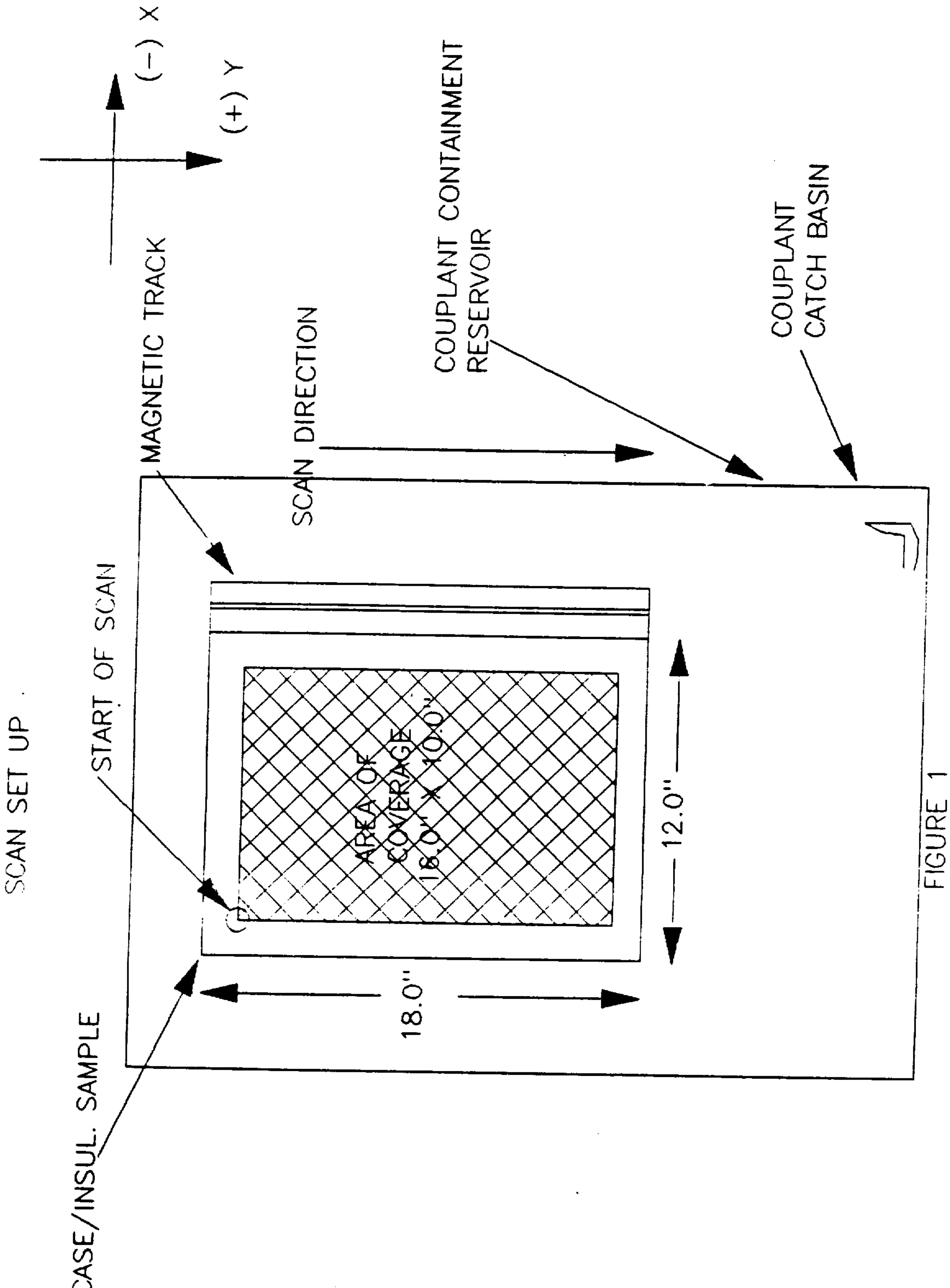

FIGURE 1

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CRT DISPLAY AND HARD COPY
VERIFICATION TESTS

DATE: 23 May 89

OPERATOR: B. Cushing

VERIFIED BY: [illegible] 5/23/89

SOFTWARE VERSION NUMBER: 40

SYSTEM SERIAL NUMBER: SA51869

PRINTER SERIAL NUMBER: SA51869

TRANSDUCER SERIAL NUMBER: RND-3

SECTION 1:

1) COMPLETE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHz TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED ...	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) SYSTEM IS IN RF MODE	BSC
e) A-SCAN GATE DELAY ~~9.0~~ 40.0 MICROSECONDS	BSC
f) A-SCAN GATE WIDTH ~~51.0~~ 26.0 MICROSECONDS	BSC
g) C-SCAN GATE DELAY IS ~~20.0~~ 47.25 MICROSECONDS	BSC
h) C-SCAN GATE WIDTH IS ~~30.0~~ 4.90 MICROSECONDS	BSC
i) COLOR PALETTE IN THE MASTER FORM HAS BEEN SET UP IN ACCORDANCE WITH AMDATA ENGINEERING SPECIFICATION NUMBER 870128, PAGE 73, "COLOR PALETTE".	BSC
j) SCAN WILL COVER AN AREA THAT IS 16.0 IN. AXIALLY BY 10.0 IN. CIRCUMFERENTIALLY.	BSC

2) PERFORM SCAN.

3) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, RETURN TO THE MASTER FORM AND CHECK THE NUMBERS ENTERED INTO THE COLOR PALETTE FORM.

4) RE-PERFORM SCAN.

5) WAS PROPER COLOR ASSIGNMENT AND DISPLAY CLARITY ACHIEVED?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________

SECTION 2:

1) RECALL THE SCREEN PRESENTATION FROM SECTION 1 OF THIS FORM AND MAKE A HARD COPY OF IT ON THE HEWLETT/PACKARD PAINTJET PRINTER.

2) COMPARE THE HARD COPY TO THE SCREEN PRESENTATION TO VERIFY THAT THE SAME COLOR LEGEND APPEARS AND THE ALL THE CHARACTERS ARE SHARPLY DEFINED AND EASY TO READ.

IF THE HARD COPY PRESENTATION MATCHES THE SCREEN PRESENTATION, ATTACH THE HARD COPY TO THIS FORM AND PROCEED TO DATA FILE INTEGRITY VERIFICATION TEST.

IF THE TWO PRESENTATIONS DON'T MATCH IN EITHER COLOR OR CLARITY, CHECK ALL CONNECTIONS, VERIFY THAT THE PRINTER IS CONFIGURED PROPERLY.

3) RE-PERFORM TEST.

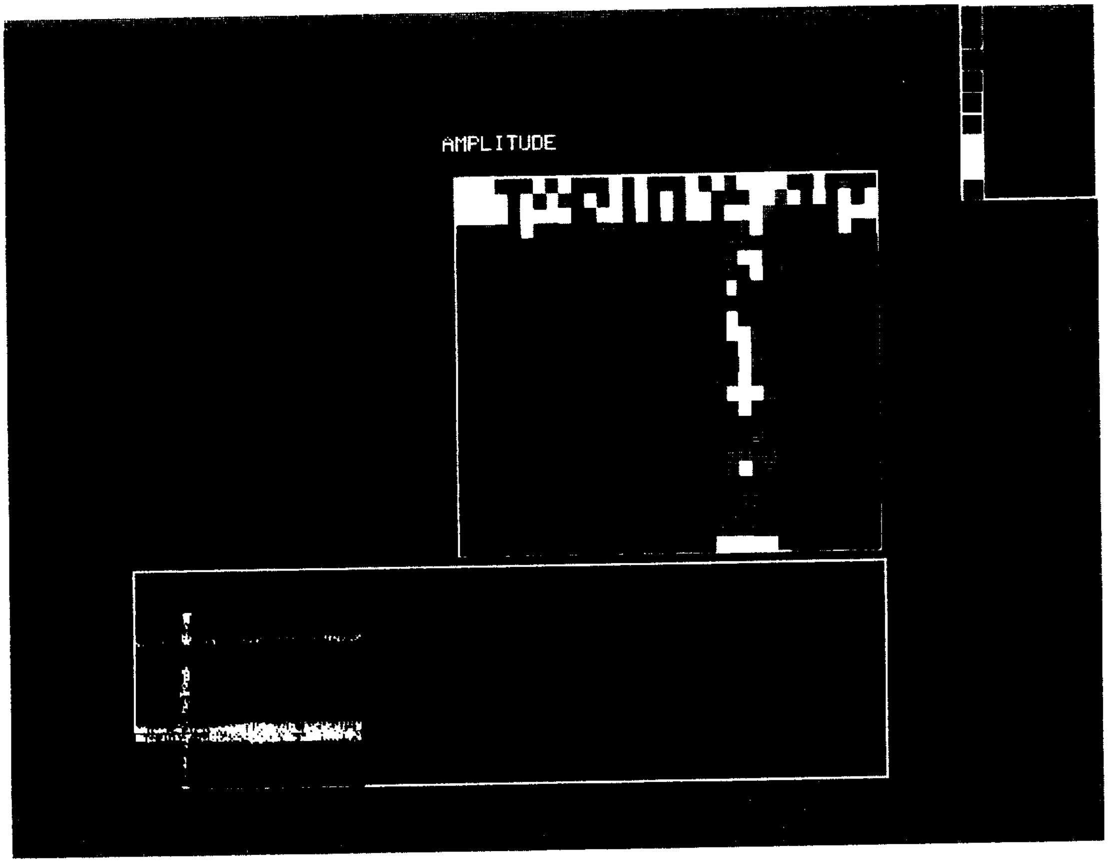
4) DID THE TWO PRESENTATIONS MATCH?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, ATTACH THE HARD COPY TO THIS FORM, AND PROCEED TO THE DATA FILE INTEGRITY VERIFICATION TEST.

IF NO, COMPLETE A PROBLEM FAILURE REPORT, FORM N, OF THIS QUALIFICATION PLAN, ATTACH THE HARD COPY TO THIS FORM AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________



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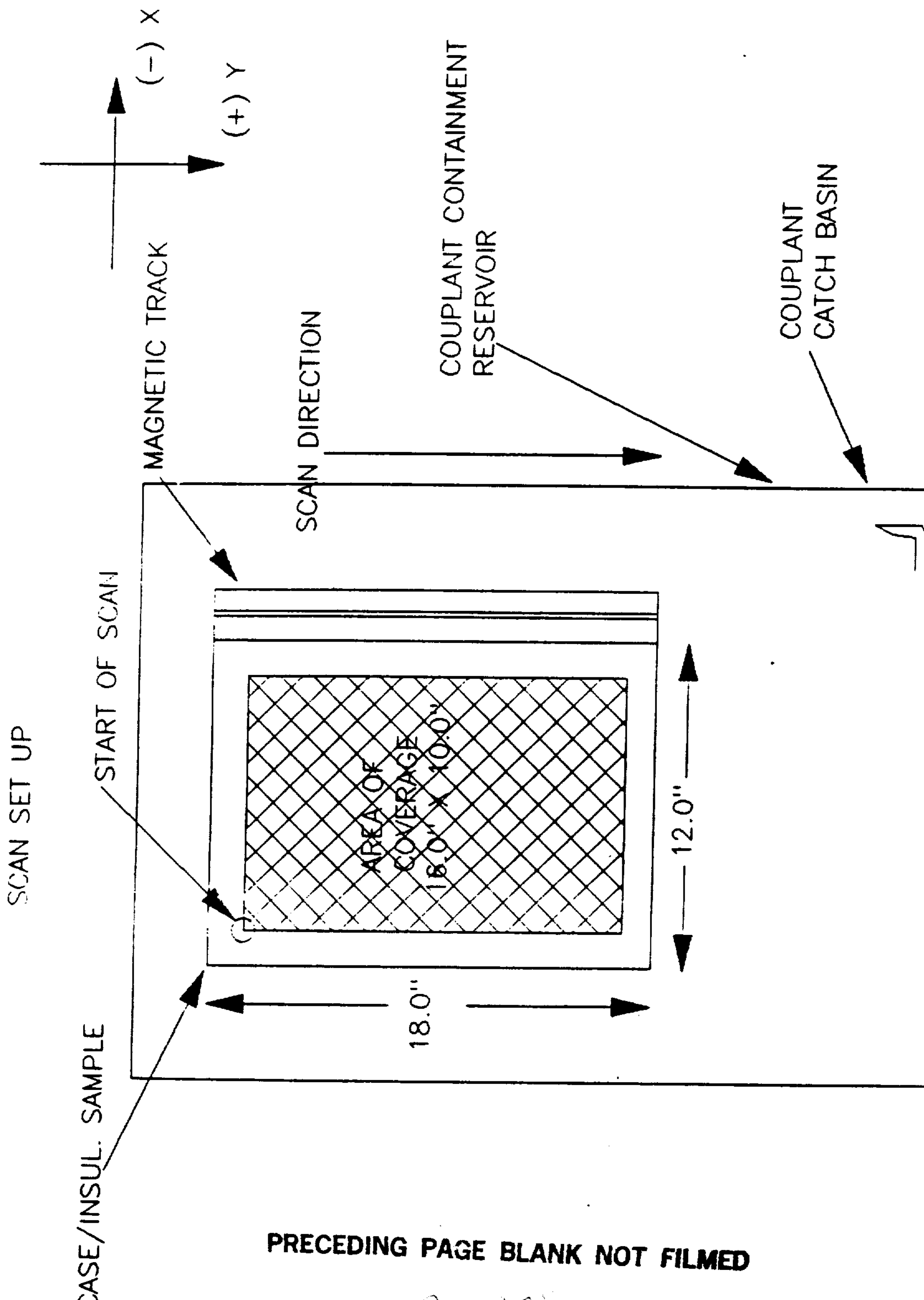

FIGURE 1

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B 308
B-309

DATA FILE INTEGRITY VERIFICATION TEST

DATE: 16/FEB/89

OPERATOR:

VERIFIED BY:

SOFTWARE VERSION NUMBER:

SYSTEM SERIAL NUMBER:

TRANSDUCER SERIAL NUMBER: TS-196 / S354

DATA TAPE SERIAL NUMBER: 5A725165K

SECTION 1

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHZ TRANSDUCER IS BEING USED	DK
b) 10.0 IN. LONG SCANNER ARM IS BEING USED	DK
c) SAMPLING INCREMENT IS 0.10 IN.	DK
d) SYSTEM IS IN RF MODE	DK
e) A-SCAN GATE DELAY 9.0 MICROSECONDS	DK
f) A-SCAN GATE WIDTH 51.0 MICROSECONDS	DK
g) C-SCAN GATE DELAY 20.0 MICROSECONDS	DK
h) C-SCAN GATE WIDTH 30.0 MICROSECONDS	DK
i) SCAN WILL COVER AN AREA THAT IS 16.0 IN. AXIALLY BY 10.0 IN. CIRCUMFERENTIALLY	DK
j) A NEW DATA TAPE HAS BEEN ACQUIRED	DK
k) PRINTER IS CONFIGURED PROPERLY	D.K
l) NAME DATA FILE SETDIVT	DK

2) PERFORM SCAN.

3) SAVE DATA TO HARD DISK.

4) HAS ALL DATA BEEN STORED PROPERLY TO HARD DISK?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, CHECK ALL CONNECTIONS, AND INFORMATION ON SET FORM, PROCEED TO STEP 4.

5) RE-PERFORM SCAN.

6) WAS RE-SCAN DATA PROPERLY SAVED AND RETRIEVABLE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO STEP 6 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________

7) OBTAIN A HARD COPY OF THE C-SCAN, B-SCAN, AND SPECTRAL C-SCAN.

8) WAS ALL REQUIRED DATA PRESENT ON EACH HARD COPY PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 10, AND APPENDIX O.

CIRCLE ONE: YES NO

IF YES, DO NOT DISCARD HARD COPY INFORMATION, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, CHECK CONNECTIONS TO PRINTER, VERIFY THAT THE SYSTEM AND PRINTER ARE CONFIGURED PROPERLY.

9) OBTAIN C, B, SPECTRAL C-SCAN HARD COPIES.

10) WAS ALL REQUIRED DATA PRESENT.

CIRCLE ONE: YES NO

IF YES, NOTE IN SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. DO NOT DISCARD THE HARD COPIES, PROCEED TO SECTION 2.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

SECTION 2

1) TRANSFER THE DATA FILES STORED ON THE HARD DISK TO TAPE.

2) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF THE TRANSFER WAS SUCCESSFUL, PROCEED TO STEP 5 OF THIS FORM.

IF THE TRANSFER WAS UNSUCCESSFUL, VERIFY THAT THE PROPER SEQUENCE OF STEPS WAS PERFORMED TO TRANSFER DATA FROM ONE MEDIA TO ANOTHER. CHECK CASSETTE TO VERIFY THAT THE "SAFE" SWITCH IS IN THE OFF POSITION, AND PROCEED TO STEP 3 OF THIS FORM.

3) PERFORM "DATA FILE TRANSFER" SEQUENCE AGAIN.

4) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF TRANSFER WAS SUCCESSFUL, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO STEP 5 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________

5) TRANSFER DATA FILES FROM TAPE BACK TO HARD DISK AND VERIFY DATA FILES WERE SUCCESSFUL TRANSFERRED.

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, PROCEED WITH STEPS 3 AND 4 OF THIS SECTION AGAIN, THIS TIME CONCERNING DATA FILE TRANSFER FROM TAPE TO DISK.

CORRECTIVE ACTION(S) ____________________

6) PERFORM STEPS 6 THROUGH 9 OF SECTION 1 OF THIS FORM. MAKE COMMENTS CONCERNING DEVIATIONS DURING EXECUTION OF THE ABOVE SET OF INSTRUCTIONS IN THE SPACE BELOW.

COMMENTS ____________________

7) COMPARE THE HARD COPIES OBTAINED FROM SECTION 1 OF THIS FORM AGAINST THE HARD COPIES OBTAINED FROM SECTION 2 OF THIS FORM.

8) WERE THE AMPLITUDE RESPONSES ON THE A AND C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN AMPLITUDE RESPONSE ____________________

9) WERE THE PHASE RESPONSES ON THE A-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN PHASE RESPONSE

10) WERE THE FREQUENCY RESPONSES ON THE B, C, SPECTRAL C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IS SPACE BELOW.

DIFFERENCES IN FREQUENCY RESPONSE

11) WERE THE COLOR SCALES AND DISPLAY CLARITY SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN COLOR SCALE AND DISPLAY CLARITY

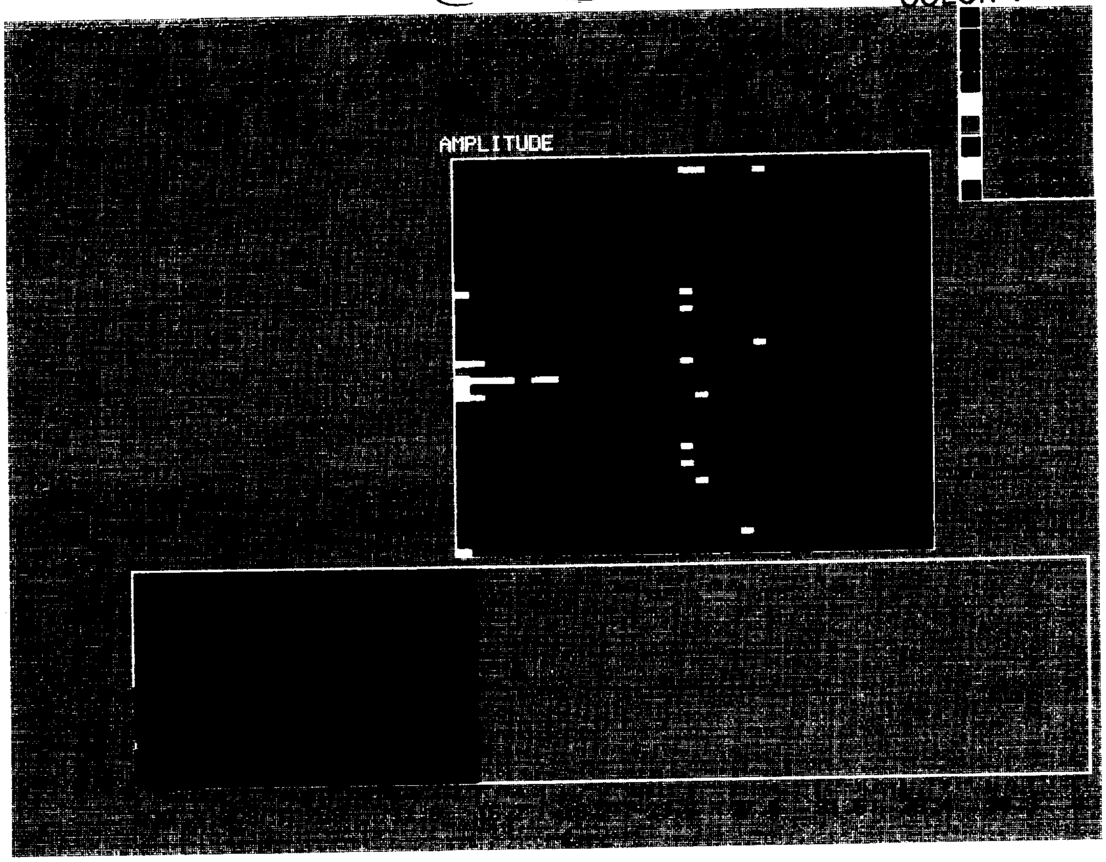
***NOTE: IF THE HARD COPIES OBTAINED FROM SECTION 1 DO NOT MATCH THE HARD COPIES FROM SECTION 2, THERE WAS A COMPROMISE IN DATA FILE INTEGRITY DURING TRANSFER. ASSEMBLE ALL HARD COPIES TOGETHER, ATTACH TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

ORIGINAL SCAN
Data File Integrity Test

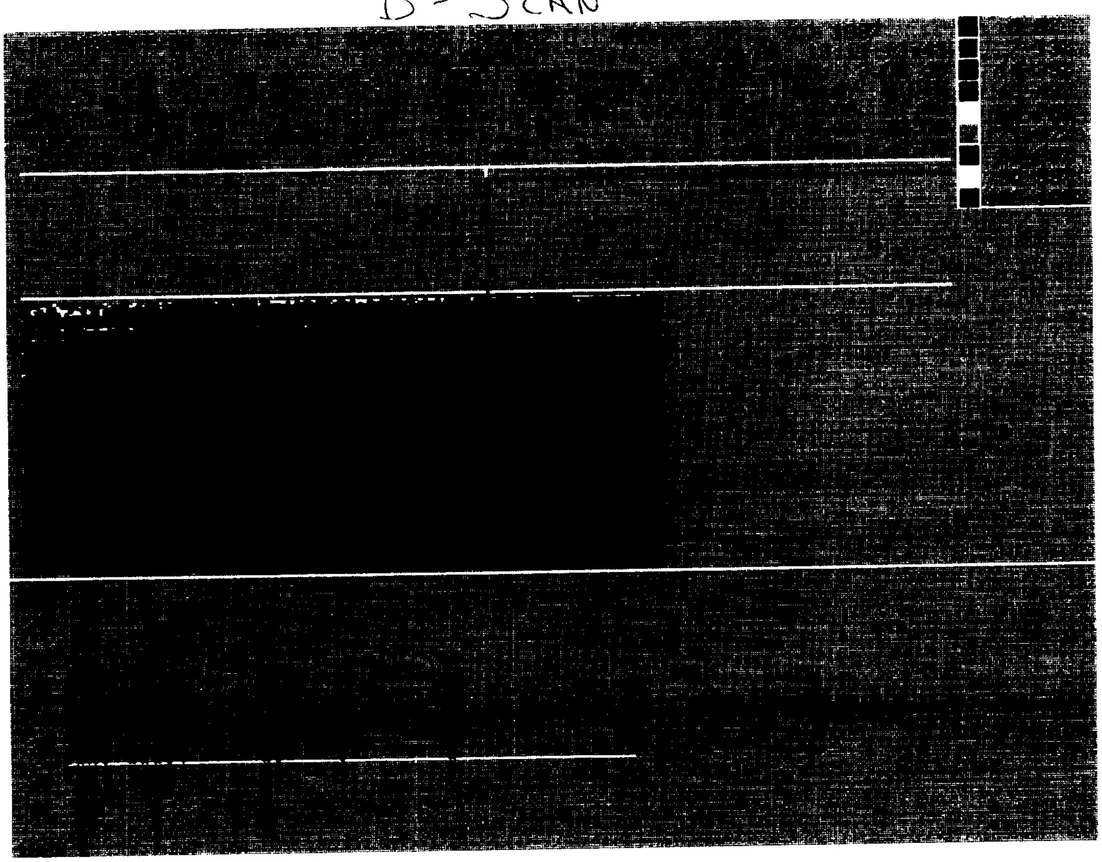
2/9/89

C-SCAN

ORIGINAL PAGE
COLOR PHOTOGRAPH



B-SCAN



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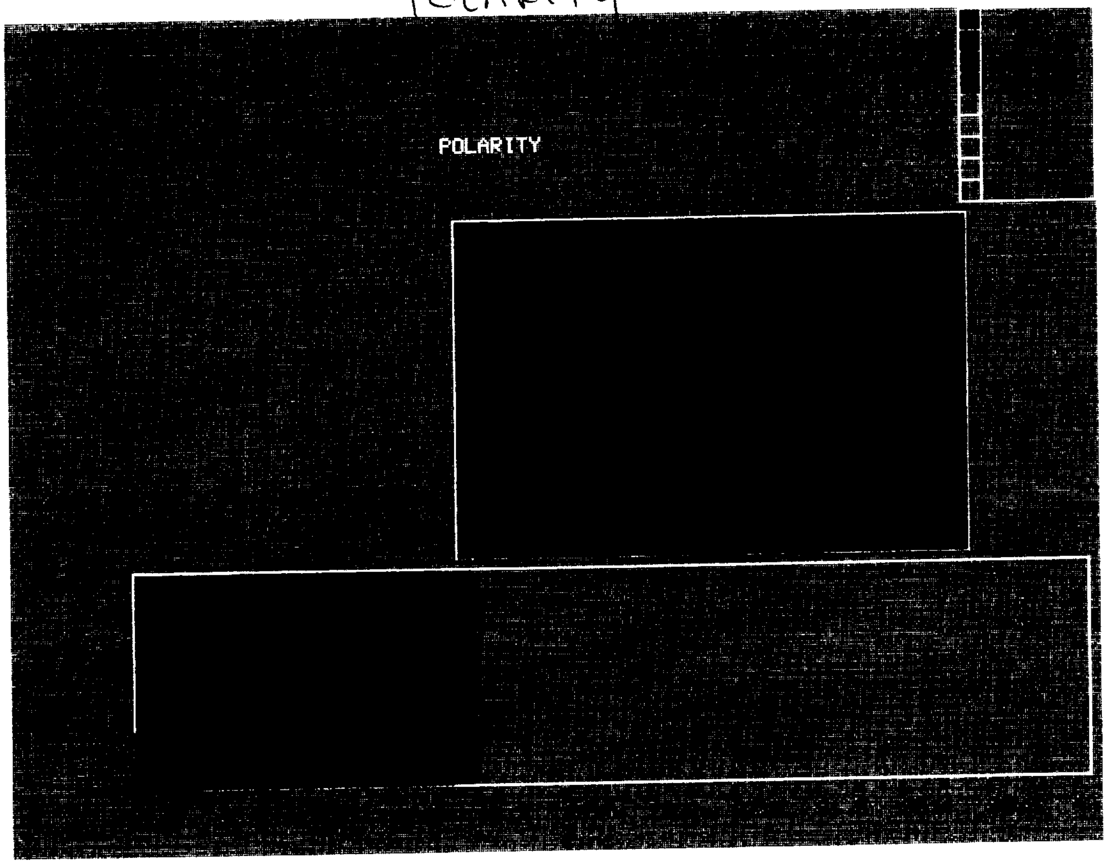
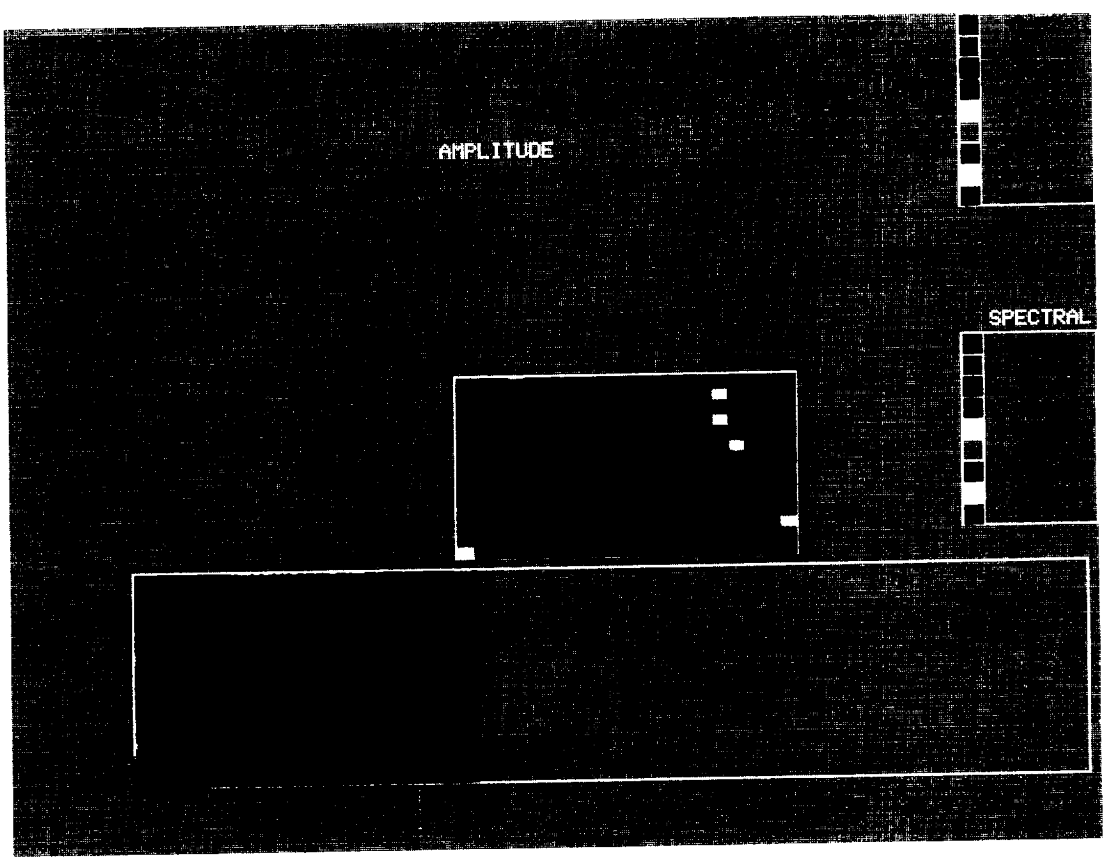
Polarity





2/10/89

tape Data of file Integrity test

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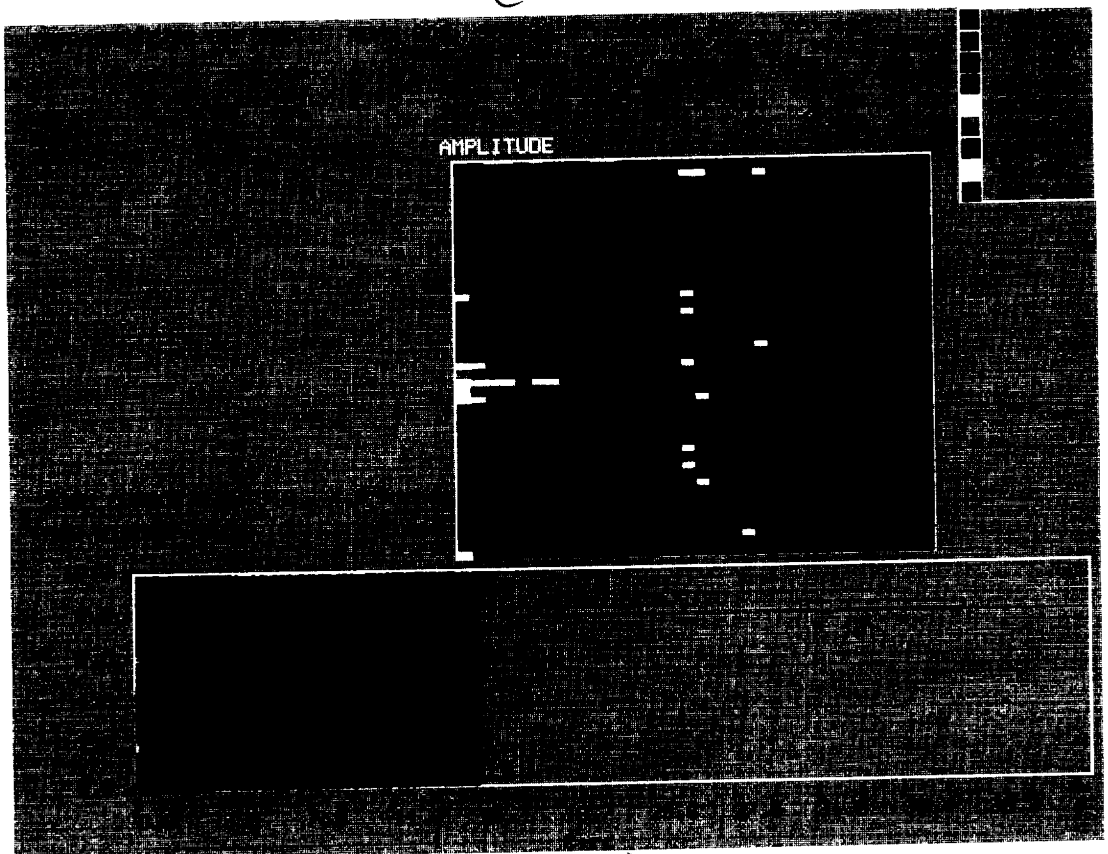
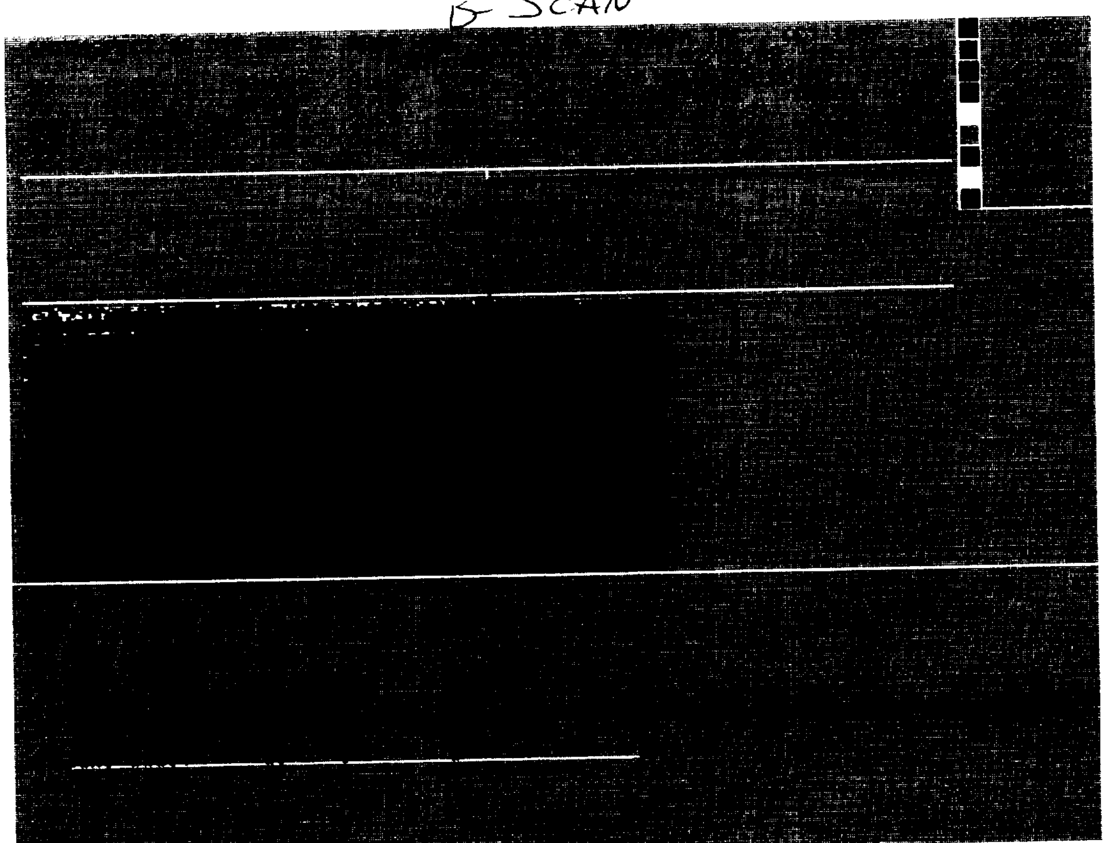
C-SCAN



B-SCAN



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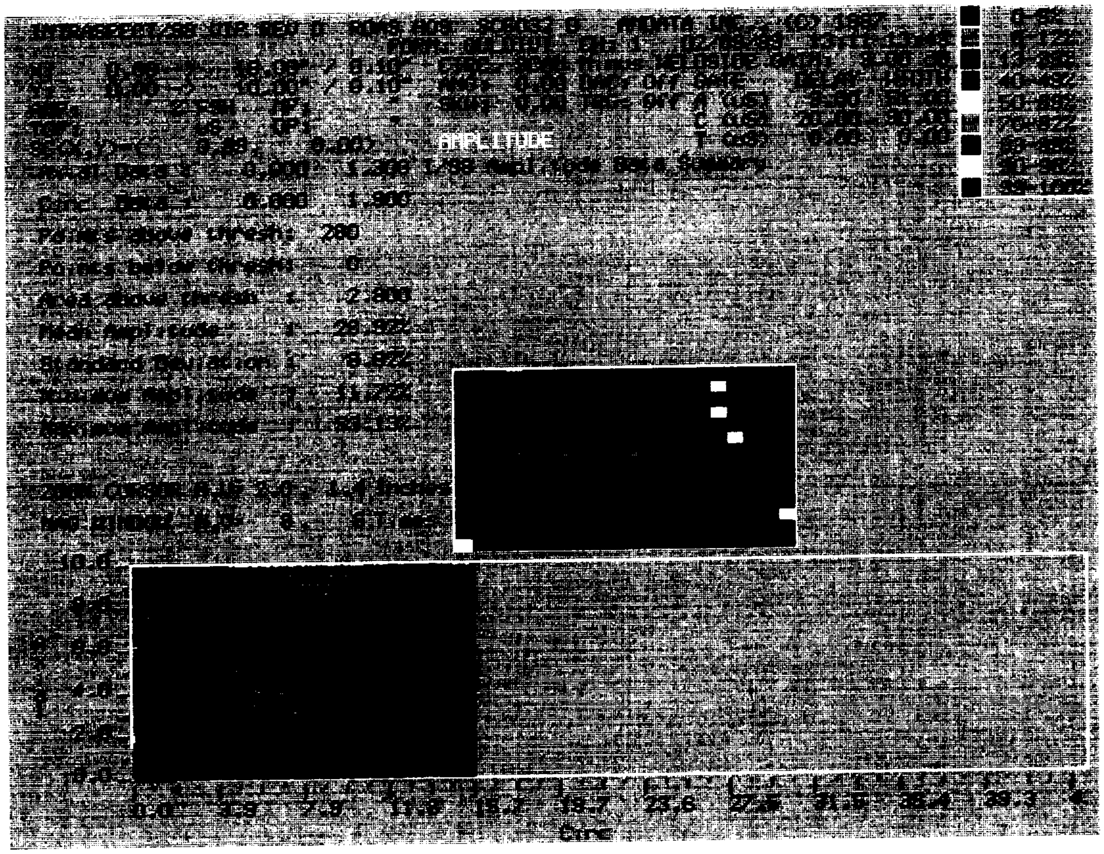
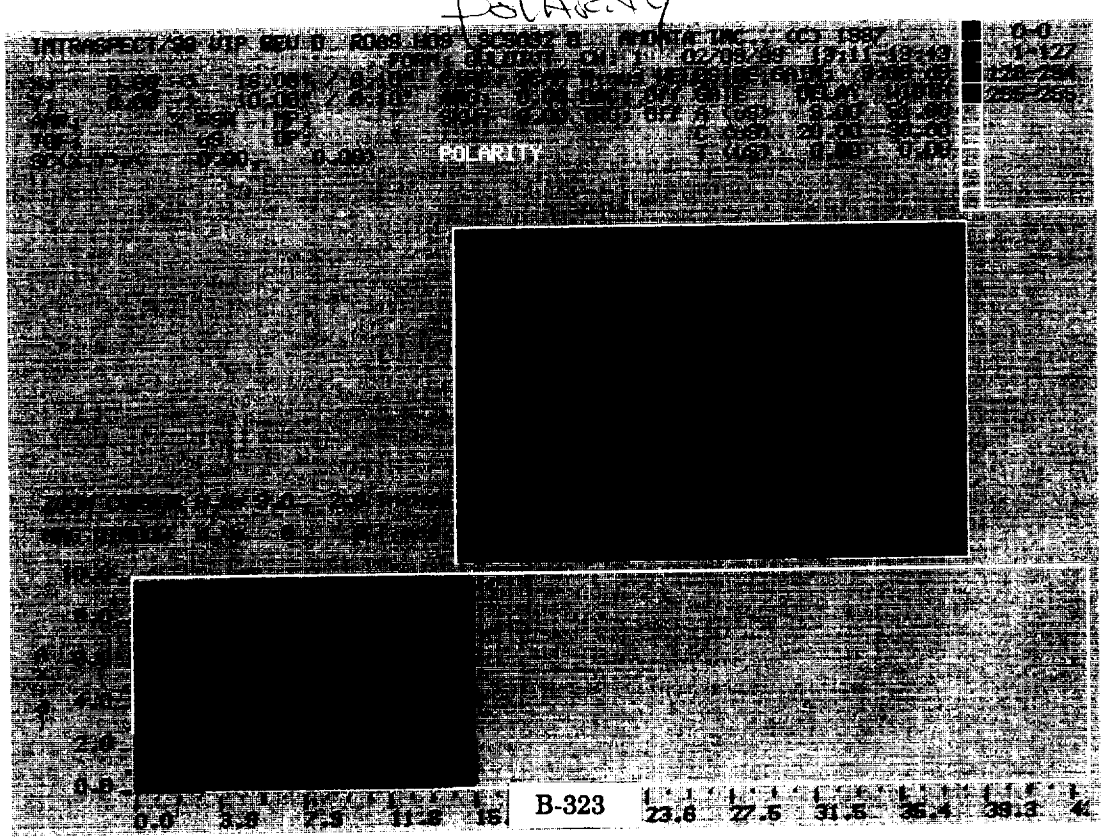


Polarity



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SCAN SET UP

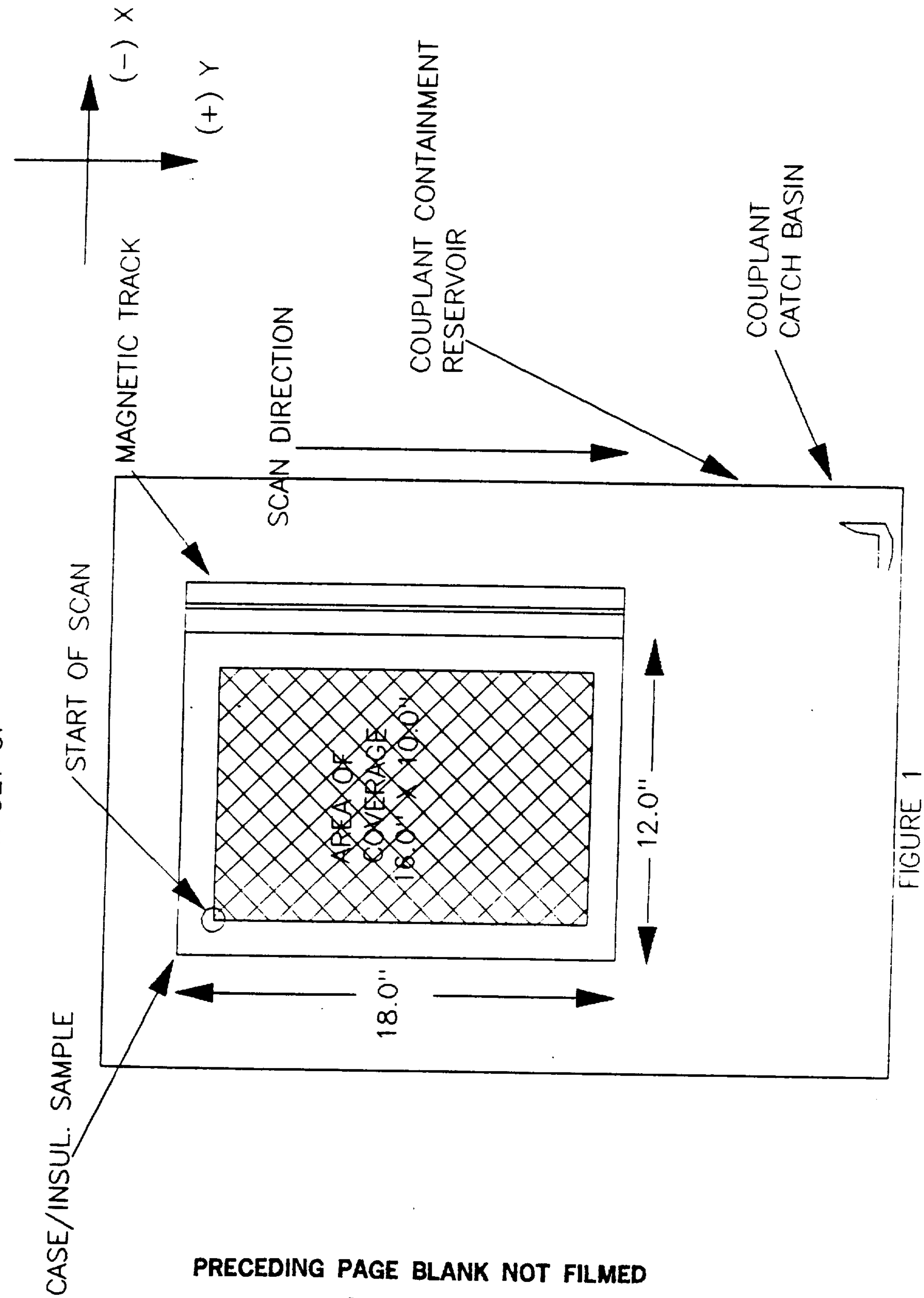

FIGURE 1

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B - 324
B - 3??

DATA FILE INTEGRITY VERIFICATION TEST

DATE: 22 Feb 89

OPERATOR: Brad Cushing

VERIFIED BY: J. Karner

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51868

TRANSDUCER SERIAL NUMBER: T8353

DATA TAPE SERIAL NUMBER: TQ2229

SECTION 1

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHZ TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) SYSTEM IS IN RF MODE	BSC
e) A-SCAN GATE DELAY ~~9.0~~ 20.0 MICROSECONDS	BSC
f) A-SCAN GATE WIDTH ~~51.0~~ 20.0 MICROSECONDS	BSC
g) C-SCAN GATE DELAY ~~20.0~~ 22.9 MICROSECONDS	BSC
h) C-SCAN GATE WIDTH ~~30.0~~ 1.65 MICROSECONDS	BSC
i) SCAN WILL COVER AN AREA THAT IS ~~16.0~~ 8.0 IN. AXIALLY BY ~~10.0~~ 5.0 IN. CIRCUMFERENTIALLY	BSC
j) A NEW DATA TAPE HAS BEEN ACQUIRED	BSC
k) PRINTER IS CONFIGURED PROPERLY	BSC
l) NAME DATA FILE SETDIVT	BSC

2) PERFORM SCAN.

3) SAVE DATA TO HARD DISK.

4) HAS ALL DATA BEEN STORED PROPERLY TO HARD DISK?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, CHECK ALL CONNECTIONS, AND INFORMATION ON SET FORM, PROCEED TO STEP 4.

5) RE-PERFORM SCAN.

6) WAS RE-SCAN DATA PROPERLY SAVED AND RETRIEVABLE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO STEP 6 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) N/A

7) OBTAIN A HARD COPY OF THE C-SCAN, B-SCAN, AND SPECTRAL C-SCAN.

8) WAS ALL REQUIRED DATA PRESENT ON EACH HARD COPY PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 10, AND APPENDIX O.

CIRCLE ONE: YES NO

IF YES, DO NOT DISCARD HARD COPY INFORMATION, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, CHECK CONNECTIONS TO PRINTER, VERIFY THAT THE SYSTEM AND PRINTER ARE CONFIGURED PROPERLY.

9) OBTAIN C, B, SPECTRAL C-SCAN HARD COPIES.

10) WAS ALL REQUIRED DATA PRESENT.

CIRCLE ONE: YES NO

IF YES, NOTE IN SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. DO NOT DISCARD THE HARD COPIES, PROCEED TO SECTION 2.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

SECTION 2

1) TRANSFER THE DATA FILES STORED ON THE HARD DISK TO TAPE.

2) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF THE TRANSFER WAS SUCCESSFUL, PROCEED TO STEP 5 OF THIS FORM.

IF THE TRANSFER WAS UNSUCCESSFUL, VERIFY THAT THE PROPER SEQUENCE OF STEPS WAS PERFORMED TO TRANSFER DATA FROM ONE MEDIA TO ANOTHER. CHECK CASSETTE TO VERIFY THAT THE "SAFE" SWITCH IS IN THE OFF POSITION, AND PROCEED TO STEP 3 OF THIS FORM.

3) PERFORM "DATA FILE TRANSFER" SEQUENCE AGAIN.

4) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF TRANSFER WAS SUCCESSFUL, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO STEP 5 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________

5) TRANSFER DATA FILES FROM TAPE BACK TO HARD DISK AND VERIFY DATA FILES WERE SUCCESSFUL TRANSFERRED.

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, PROCEED WITH STEPS 3 AND 4 OF THIS SECTION AGAIN, THIS TIME CONCERNING DATA FILE TRANSFER FROM TAPE TO DISK.

CORRECTIVE ACTION(S) ______________________________

6) PERFORM STEPS 6 THROUGH 9 OF SECTION 1 OF THIS FORM. MAKE COMMENTS CONCERNING DEVIATIONS DURING EXECUTION OF THE ABOVE SET OF INSTRUCTIONS IN THE SPACE BELOW.

COMMENTS ______________________________

7) COMPARE THE HARD COPIES OBTAINED FROM SECTION 1 OF THIS FORM AGAINST THE HARD COPIES OBTAINED FROM SECTION 2 OF THIS FORM.

8) WERE THE AMPLITUDE RESPONSES ON THE A AND C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN AMPLITUDE RESPONSE ______________________________

9) WERE THE PHASE RESPONSES ON THE A-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN PHASE RESPONSE ______________________________

10) WERE THE FREQUENCY RESPONSES ON THE B, C, SPECTRAL C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IS SPACE BELOW.

DIFFERENCES IN FREQUENCY RESPONSE ______________________________

11) WERE THE COLOR SCALES AND DISPLAY CLARITY SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN COLOR SCALE AND DISPLAY CLARITY ______________________________

***NOTE: IF THE HARD COPIES OBTAINED FROM SECTION 1 DO NOT MATCH THE HARD COPIES FROM SECTION 2, THERE WAS A COMPROMISE IN DATA FILE INTEGRITY DURING TRANSFER. ASSEMBLE ALL HARD COPIES TOGETHER, ATTACH TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

ORIGINAL PAGE
COLOR PHOTOGRAPH

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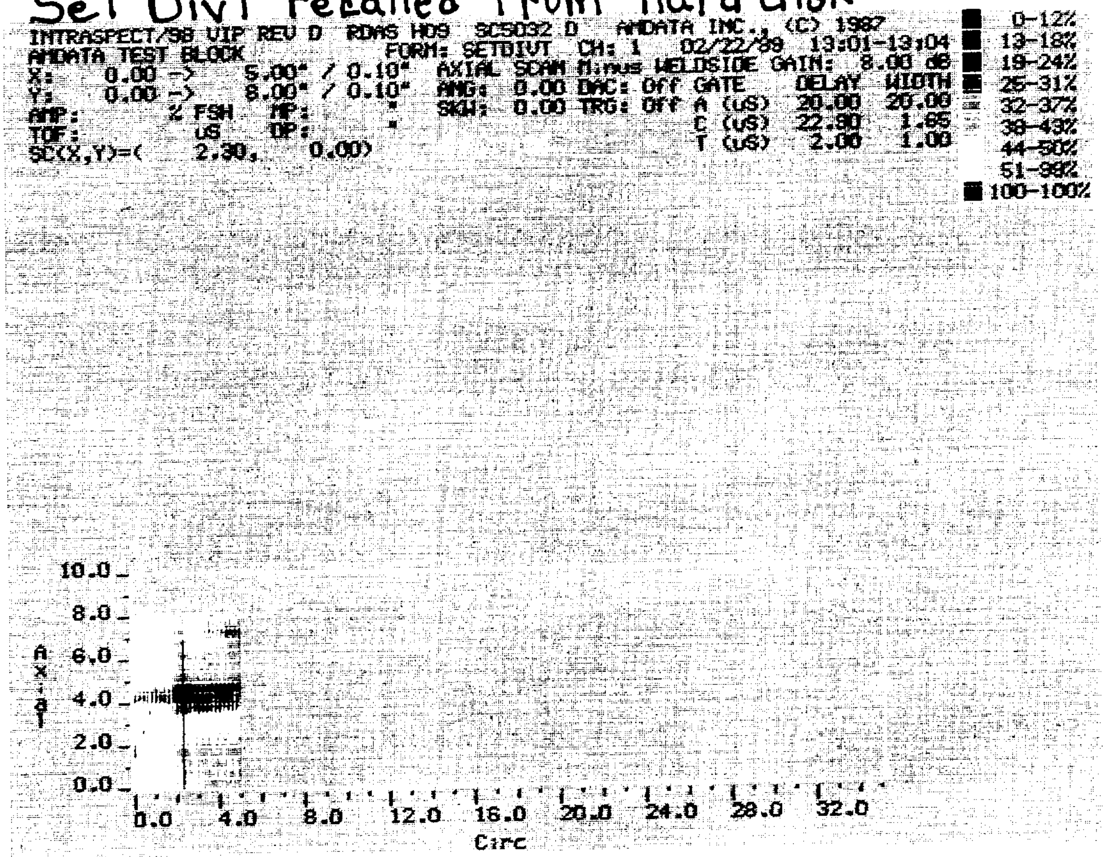

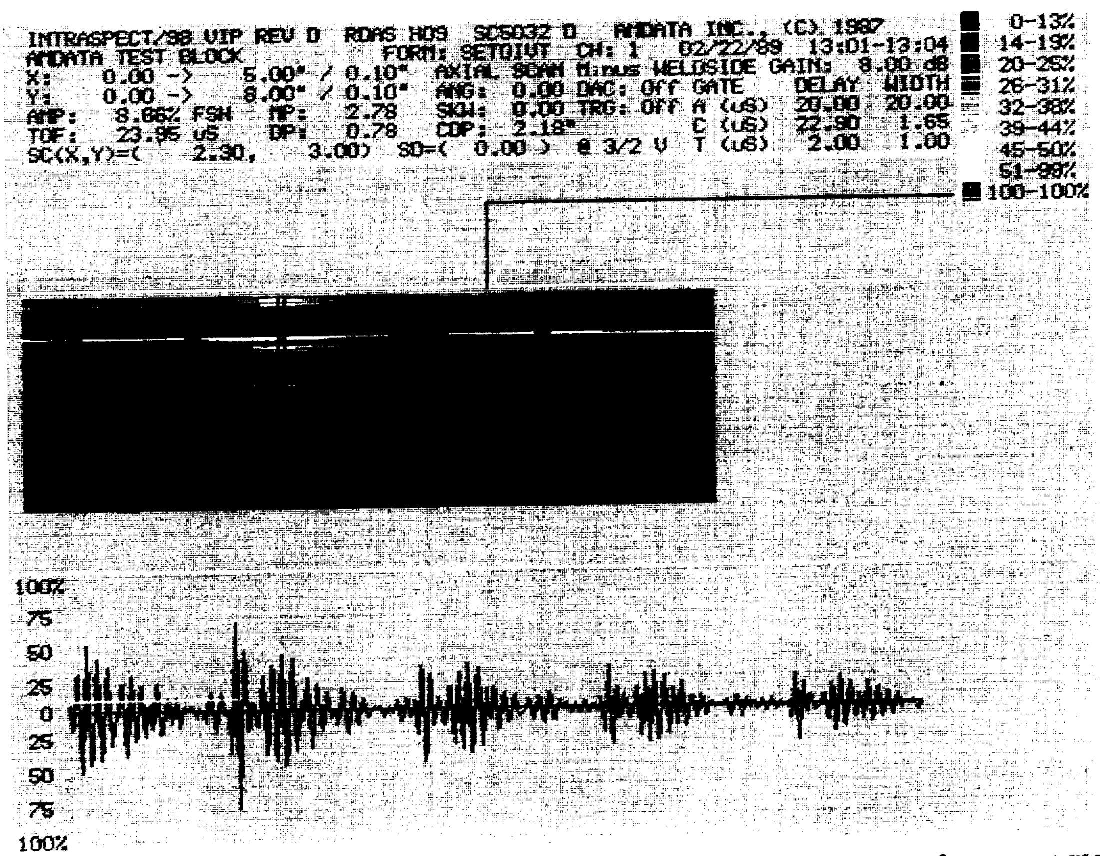

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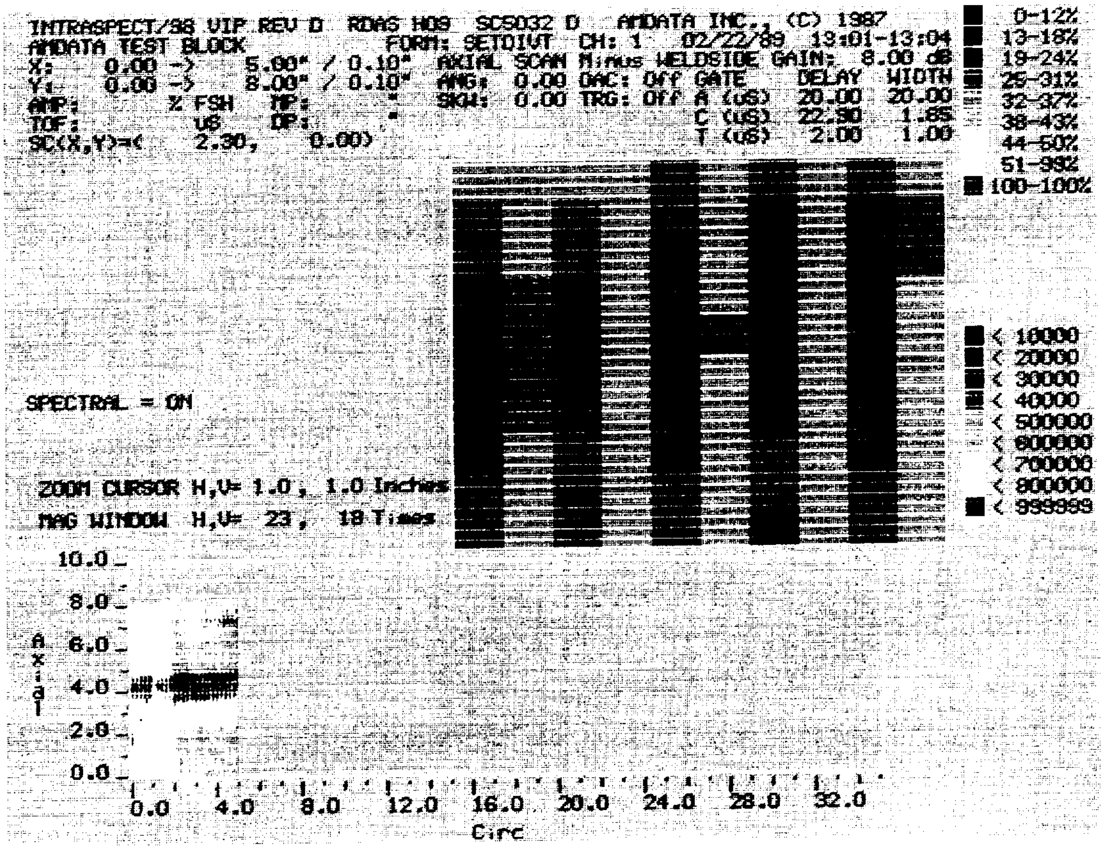
COLOR PHOTOGRAPH

Spectral C-Scan "on"



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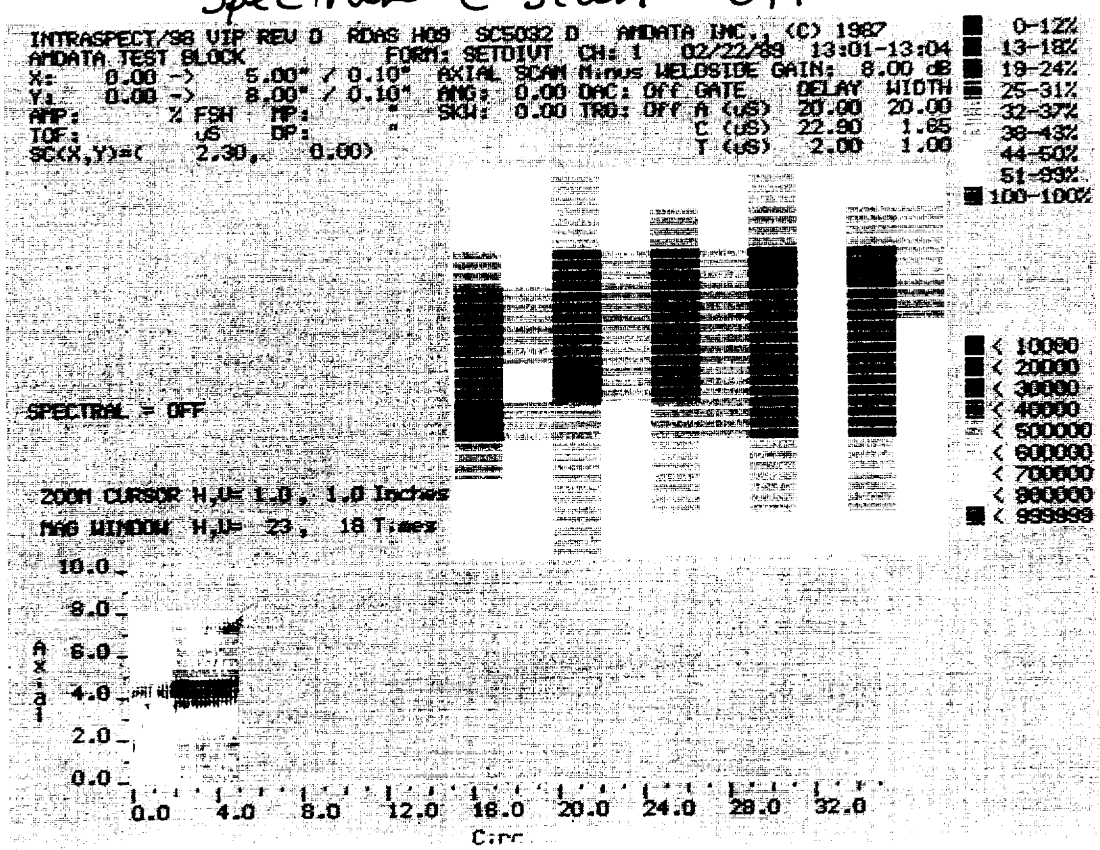

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ORIGINAL PAGE
COLOR PHOTOGRAPH

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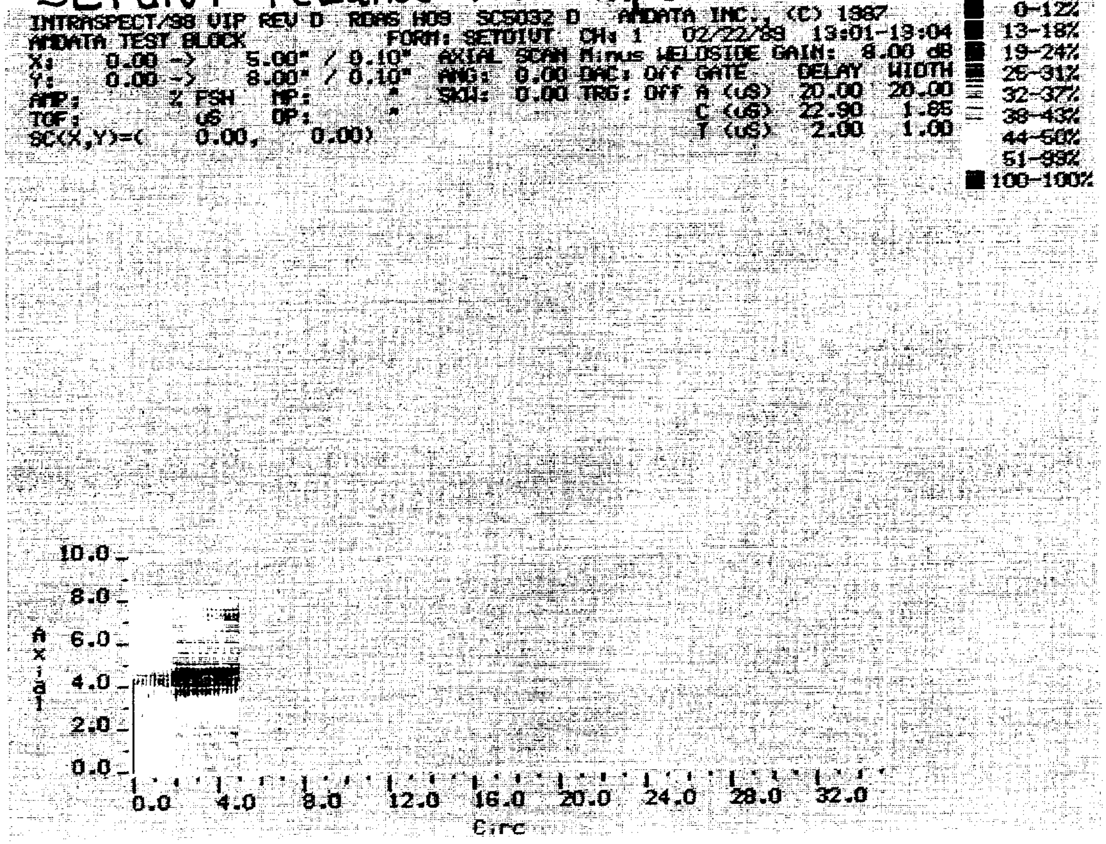

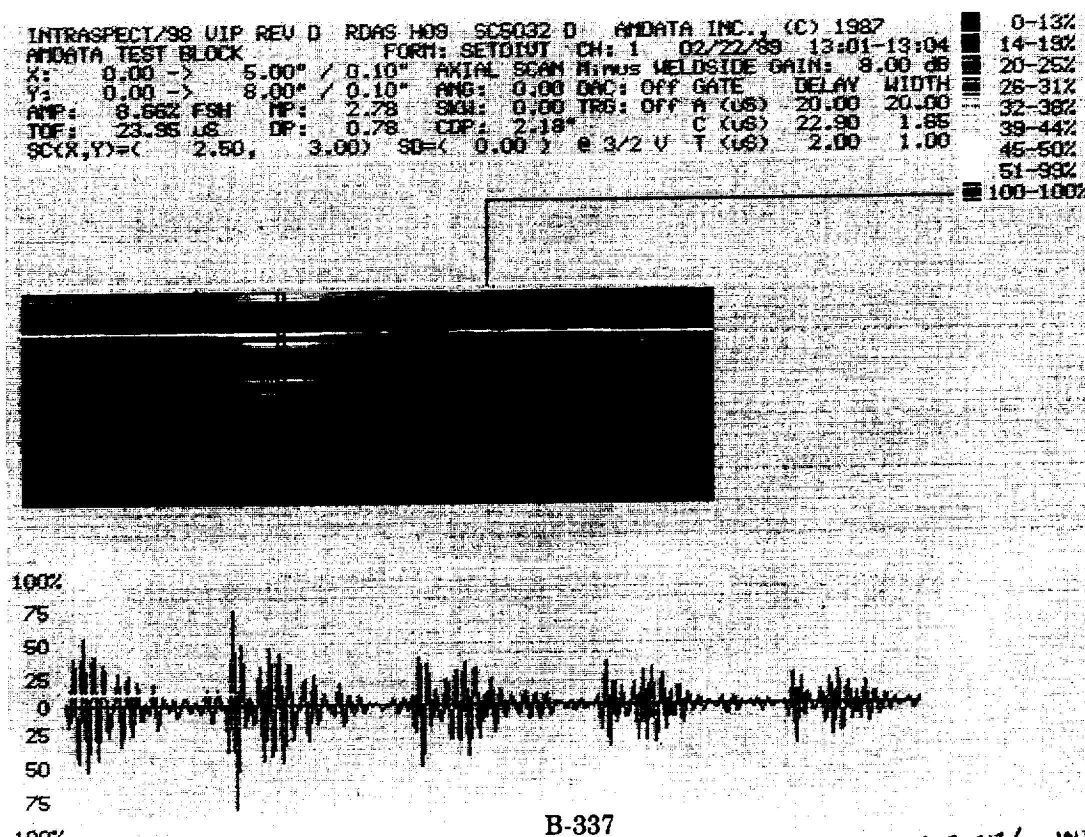

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Setdivt recalled from Tape

ORIGINAL PAGE
COLOR PHOTOGRAPH

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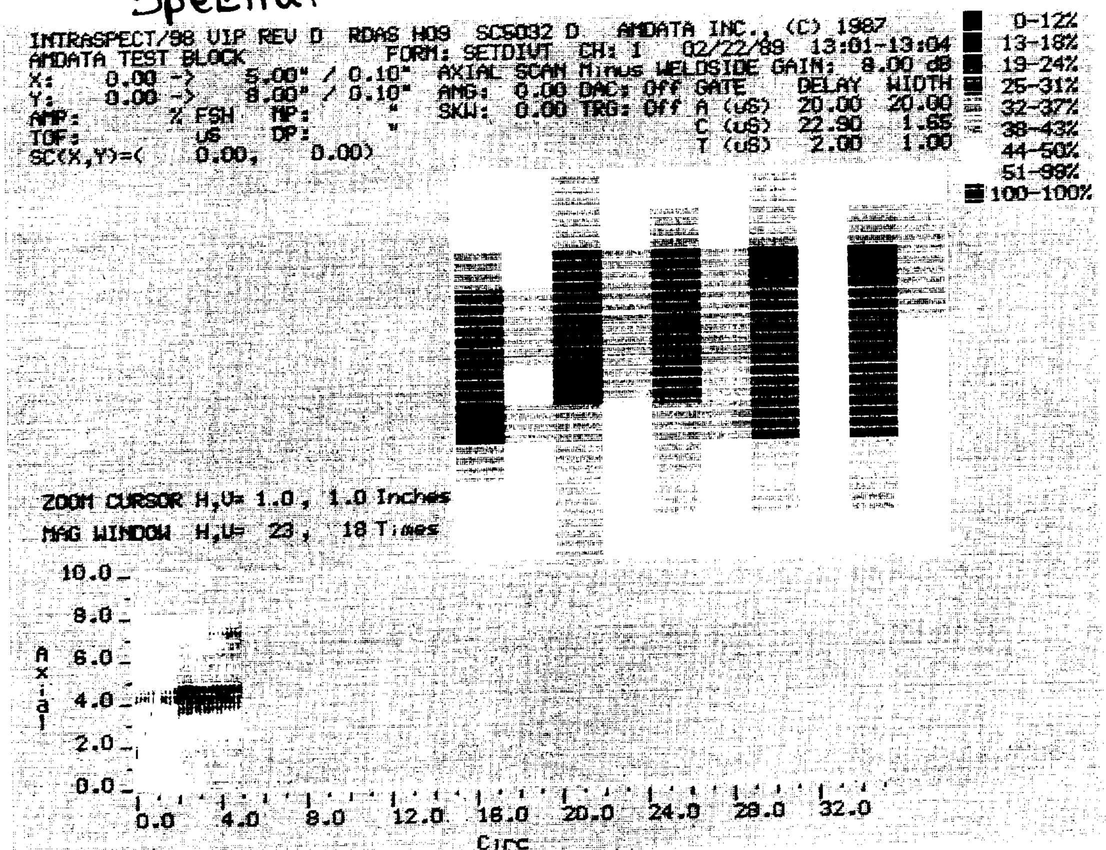

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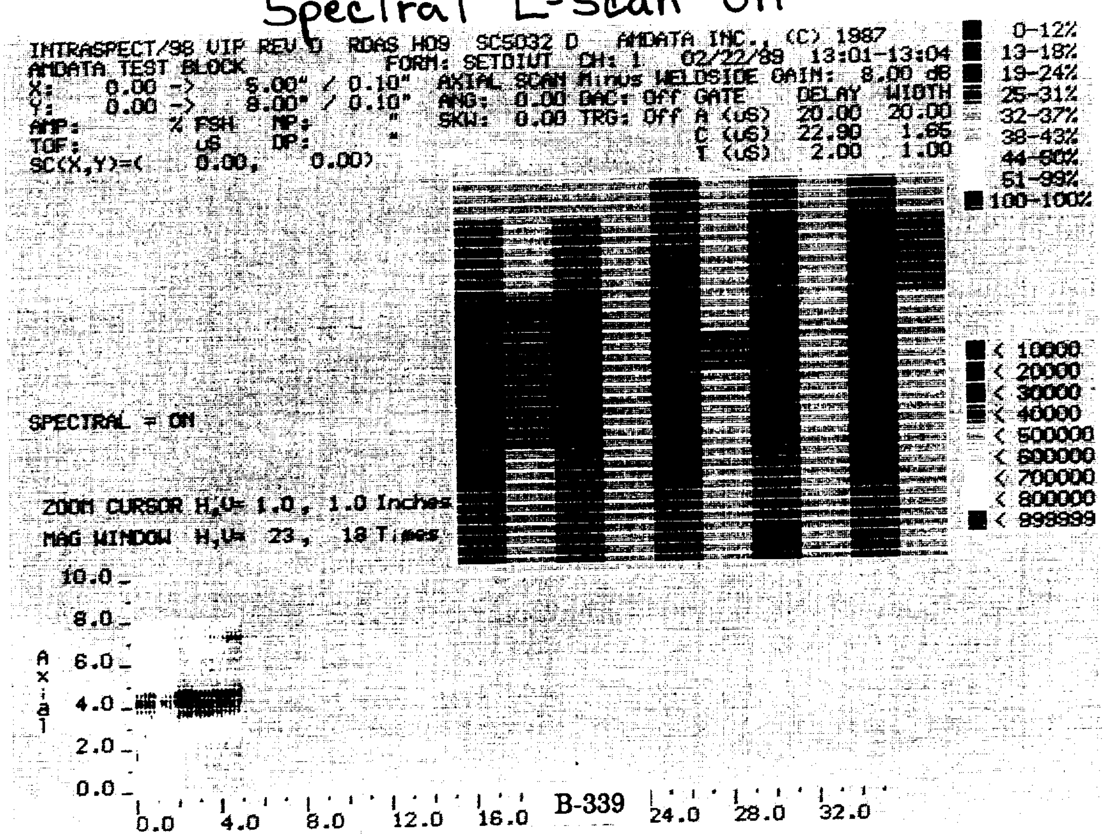

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ATTACH HARD COPIES HERE

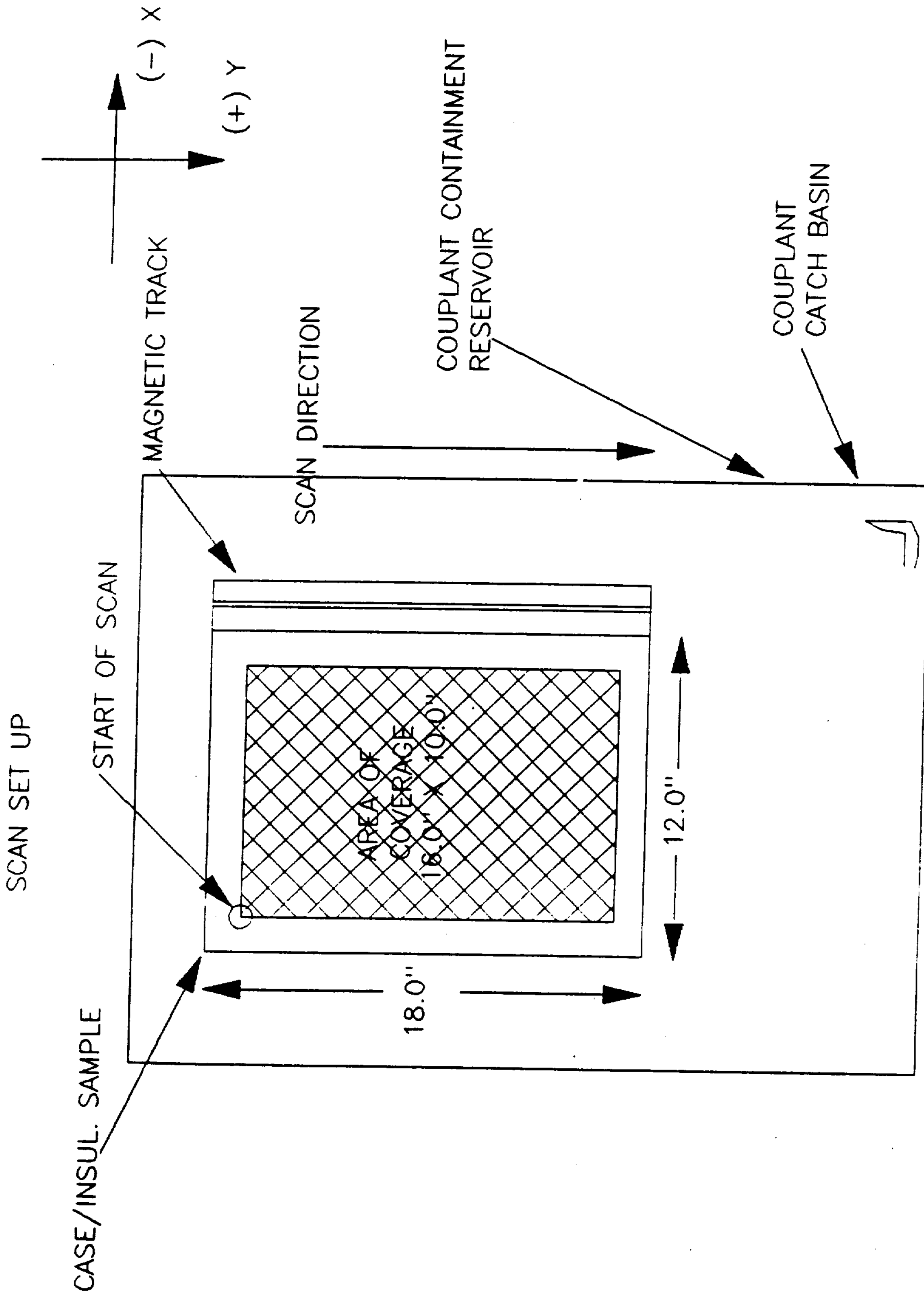

FIGURE 1

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B-340
B-341

DATA FILE INTEGRITY VERIFICATION TEST

DATE: 9 March 89
OPERATOR: Brad Cushing
VERIFIED BY: [illegible]
SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA 51865
TRANSDUCER SERIAL NUMBER: RD-3
DATA TAPE SERIAL NUMBER: T03099

SECTION 1

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

		COMPLETED (INITIALS)
a)	5.0 MHZ TRANSDUCER IS BEING USED	BSC
b)	10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c)	SAMPLING INCREMENT IS 0.10 IN.	BSC
d)	SYSTEM IS IN RF MODE	BSC
e)	A-SCAN GATE DELAY ~~9.0~~ 20.0 MICROSECONDS	BSC
f)	A-SCAN GATE WIDTH ~~51.0~~ 23.8 MICROSECONDS	BSC
g)	C-SCAN GATE DELAY ~~20.0~~ 22.8 MICROSECONDS	BSC
h)	C-SCAN GATE WIDTH ~~30.0~~ 2.35 MICROSECONDS	BSC
i)	SCAN WILL COVER AN AREA THAT IS ~~16.0~~ 10.0 IN. AXIALLY BY ~~10.0~~ 5.0 IN. CIRCUMFERENTIALLY	BSC
j)	A NEW DATA TAPE HAS BEEN ACQUIRED	BSC
k)	PRINTER IS CONFIGURED PROPERLY	BSC
l)	NAME DATA FILE SETDIVT	BSC

2) PERFORM SCAN.

3) SAVE DATA TO HARD DISK.

4) HAS ALL DATA BEEN STORED PROPERLY TO HARD DISK?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, CHECK ALL CONNECTIONS, AND INFORMATION ON SET FORM, PROCEED TO STEP 4.

5) RE-PERFORM SCAN.

6) WAS RE-SCAN DATA PROPERLY SAVED AND RETRIEVABLE?

CIRCLE ONE: YES NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO STEP 6 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ____________________

7) OBTAIN A HARD COPY OF THE C-SCAN, B-SCAN, AND SPECTRAL C-SCAN.

8) WAS ALL REQUIRED DATA PRESENT ON EACH HARD COPY PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 10, AND APPENDIX O.

CIRCLE ONE: YES NO

IF YES, DO NOT DISCARD HARD COPY INFORMATION, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, CHECK CONNECTIONS TO PRINTER, VERIFY THAT THE SYSTEM AND PRINTER ARE CONFIGURED PROPERLY.

9) OBTAIN C, B, SPECTRAL C-SCAN HARD COPIES.

10) WAS ALL REQUIRED DATA PRESENT.

CIRCLE ONE: YES NO

IF YES, NOTE IN SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. DO NOT DISCARD THE HARD COPIES, PROCEED TO SECTION 2.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

SECTION 2

1) TRANSFER THE DATA FILES STORED ON THE HARD DISK TO TAPE.

2) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF THE TRANSFER WAS SUCCESSFUL, PROCEED TO STEP 5 OF THIS FORM.

IF THE TRANSFER WAS UNSUCCESSFUL, VERIFY THAT THE PROPER SEQUENCE OF STEPS WAS PERFORMED TO TRANSFER DATA FROM ONE MEDIA TO ANOTHER. CHECK CASSETTE TO VERIFY THAT THE "SAFE" SWITCH IS IN THE OFF POSITION, AND PROCEED TO STEP 3 OF THIS FORM.

3) PERFORM "DATA FILE TRANSFER" SEQUENCE AGAIN.

4) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF TRANSFER WAS SUCCESSFUL, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO STEP 5 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ____
____
____
____
____
____

5) TRANSFER DATA FILES FROM TAPE BACK TO HARD DISK AND VERIFY DATA FILES WERE SUCCESSFUL TRANSFERRED.

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, PROCEED WITH STEPS 3 AND 4 OF THIS SECTION AGAIN, THIS TIME CONCERNING DATA FILE TRANSFER FROM TAPE TO DISK.

CORRECTIVE ACTION(S) ______________________________

6) PERFORM STEPS 6 THROUGH 9 OF SECTION 1 OF THIS FORM. MAKE COMMENTS CONCERNING DEVIATIONS DURING EXECUTION OF THE ABOVE SET OF INSTRUCTIONS IN THE SPACE BELOW.

COMMENTS ______________________________

7) COMPARE THE HARD COPIES OBTAINED FROM SECTION 1 OF THIS FORM AGAINST THE HARD COPIES OBTAINED FROM SECTION 2 OF THIS FORM.

8) WERE THE AMPLITUDE RESPONSES ON THE A AND C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN AMPLITUDE RESPONSE ______________________________

9) WERE THE PHASE RESPONSES ON THE A-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN PHASE RESPONSE ______________________

10) WERE THE FREQUENCY RESPONSES ON THE B, C, SPECTRAL C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IS SPACE BELOW.

DIFFERENCES IN FREQUENCY RESPONSE ______________________

11) WERE THE COLOR SCALES AND DISPLAY CLARITY SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

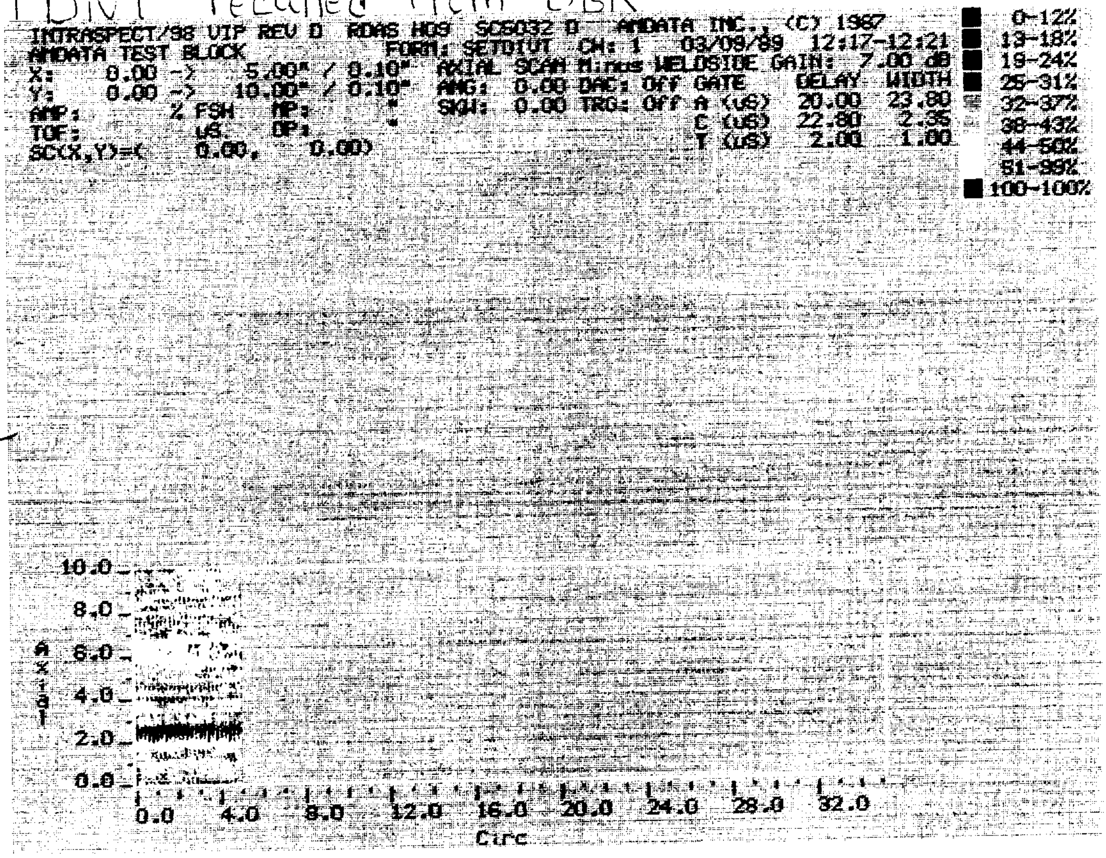
DIFFERENCES IN COLOR SCALE AND DISPLAY CLARITY ______________________

***NOTE: IF THE HARD COPIES OBTAINED FROM SECTION 1 DO NOT MATCH THE HARD COPIES FROM SECTION 2, THERE WAS A COMPROMISE IN DATA FILE INTEGRITY DURING TRANSFER. ASSEMBLE ALL HARD COPIES TOGETHER, ATTACH TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

ORIGINAL PAGE
COLOR PHOTOGRAPH

Set Divt recalled from Disk

C



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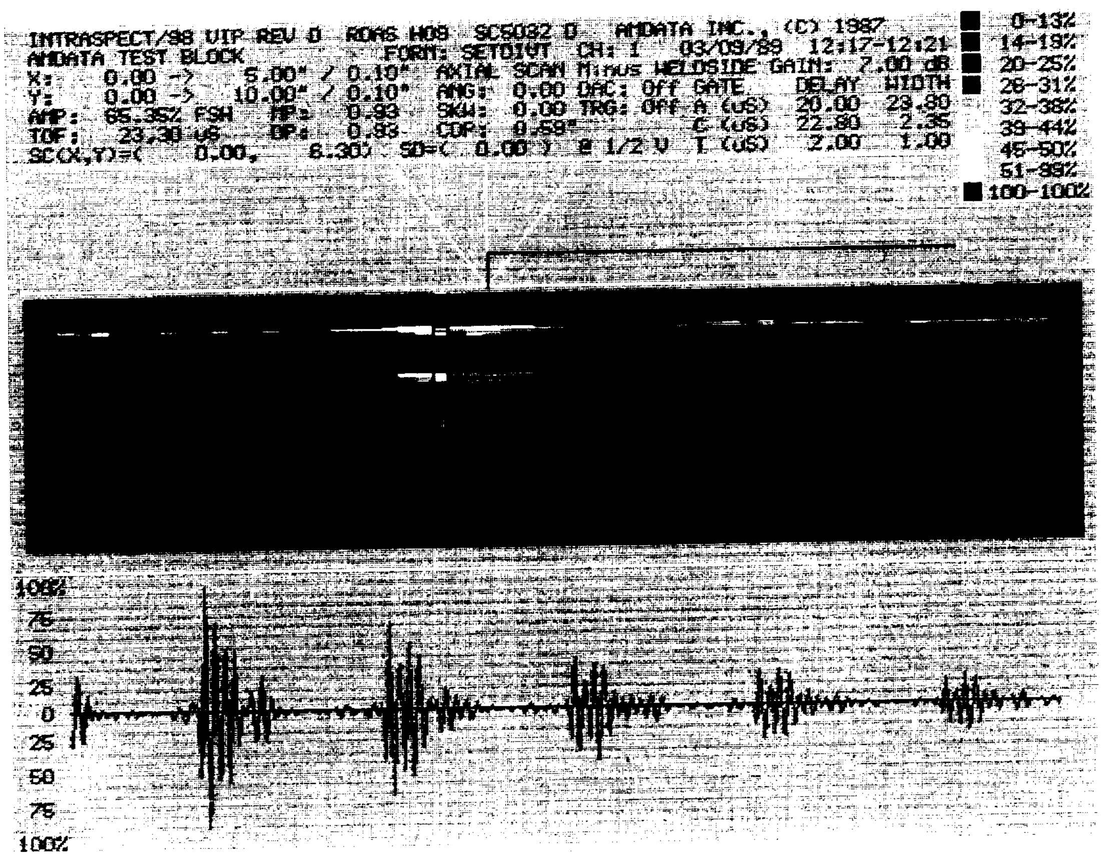

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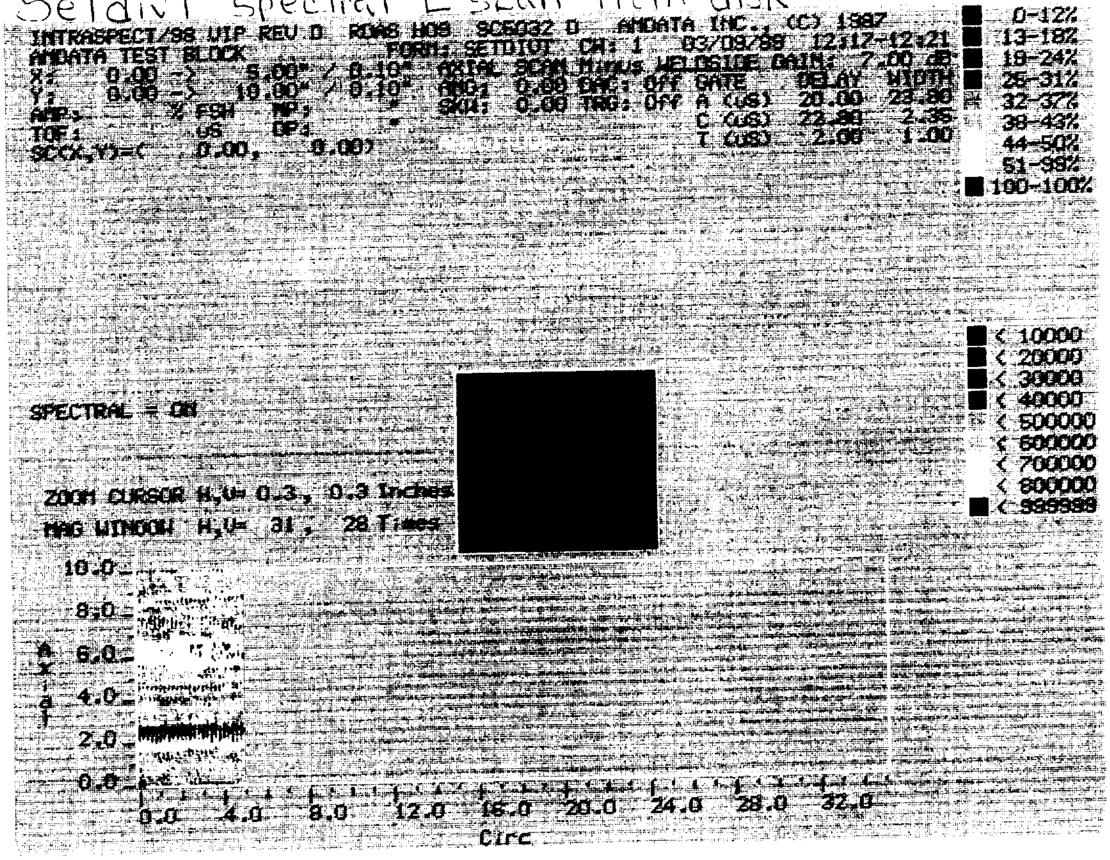
COLOR PHOTOGRAPH

Setdivt spectral C-scan from disk



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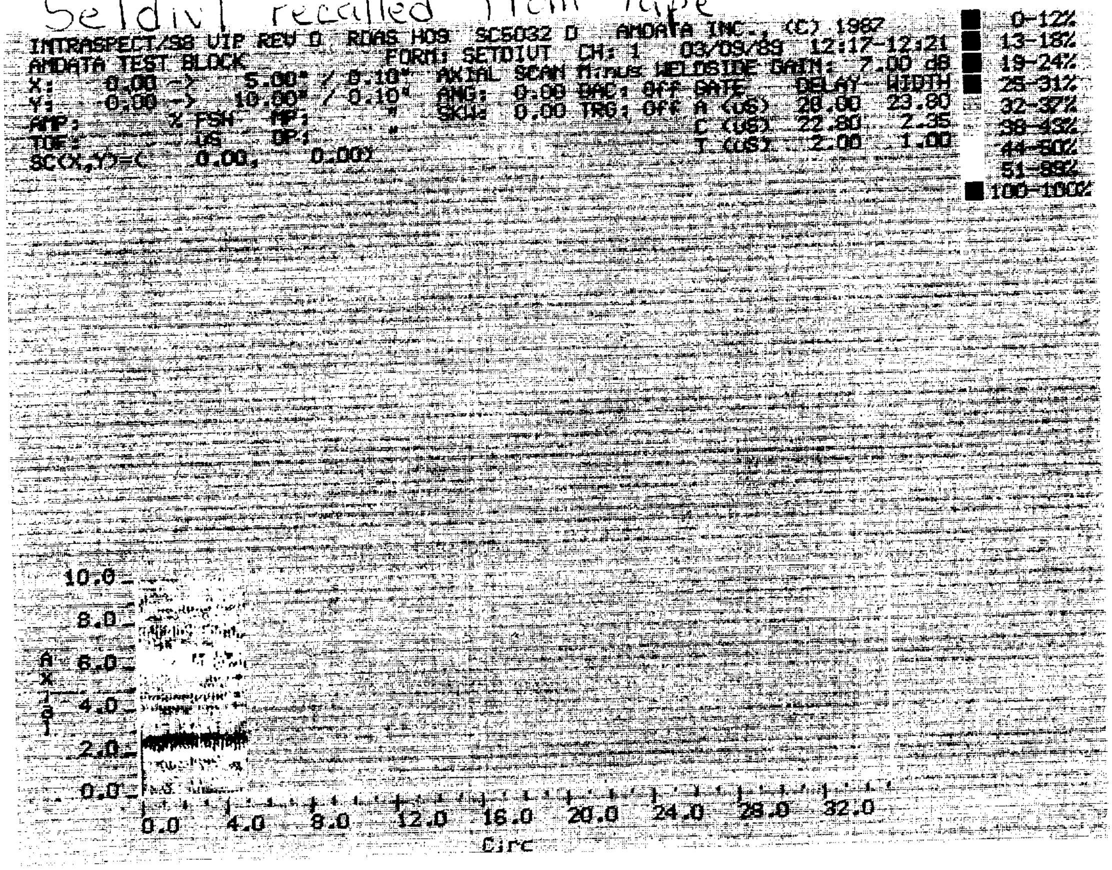
ORIGINAL PAGE
COLOR PHOTOGRAPH

Setdivt recalled from Tape

C



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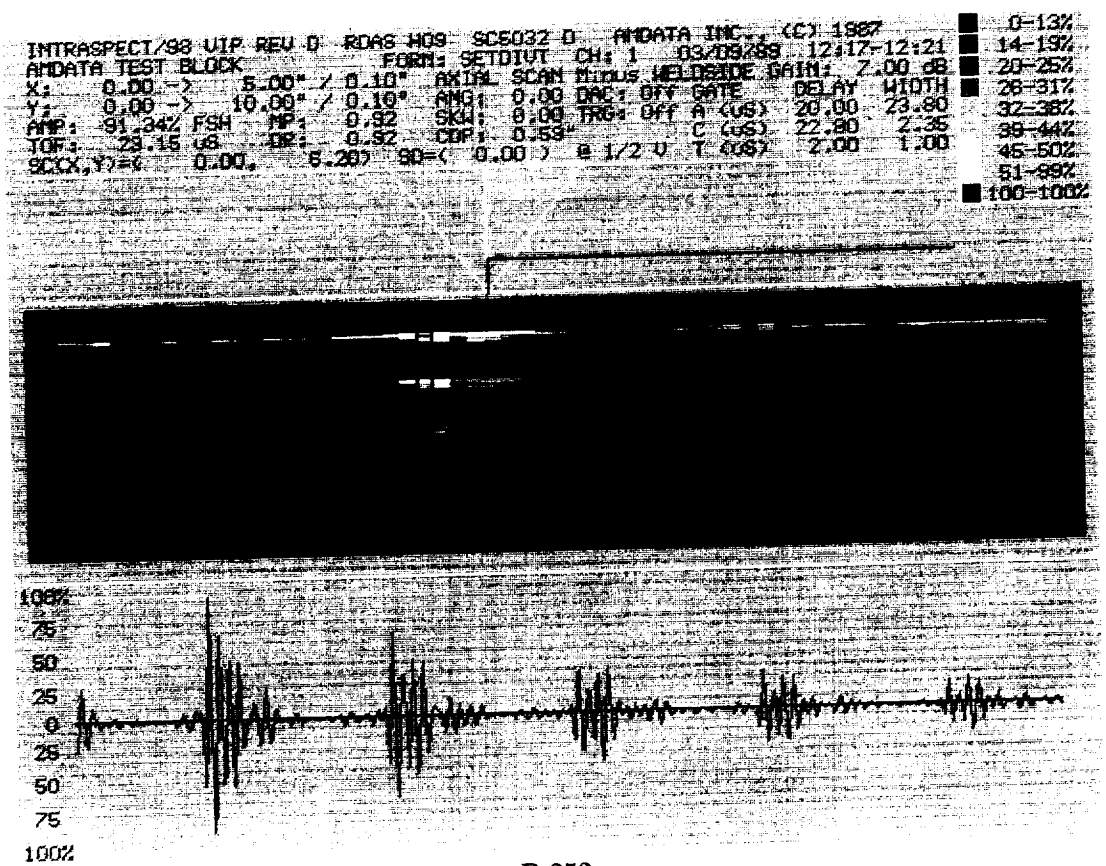

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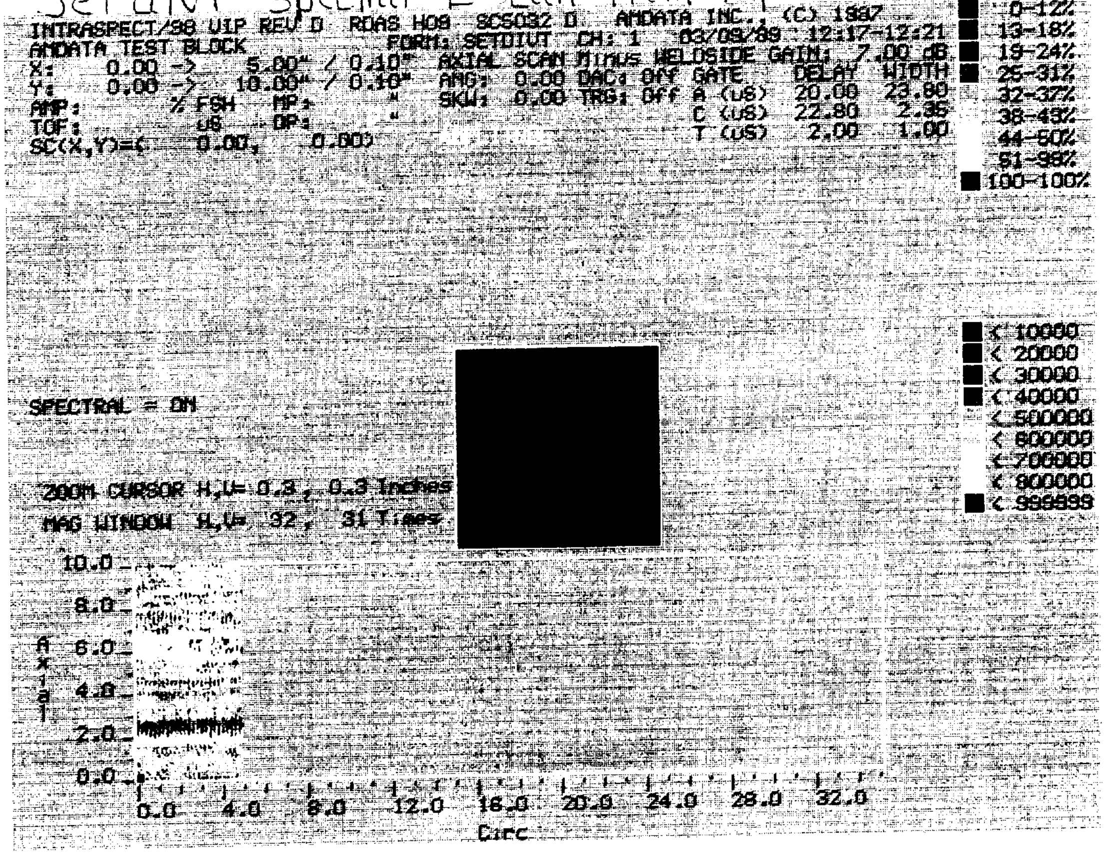
ORIGINAL PAGE
COLOR PHOTOGRAPH

Setdivt spectral C-scan Trent tape



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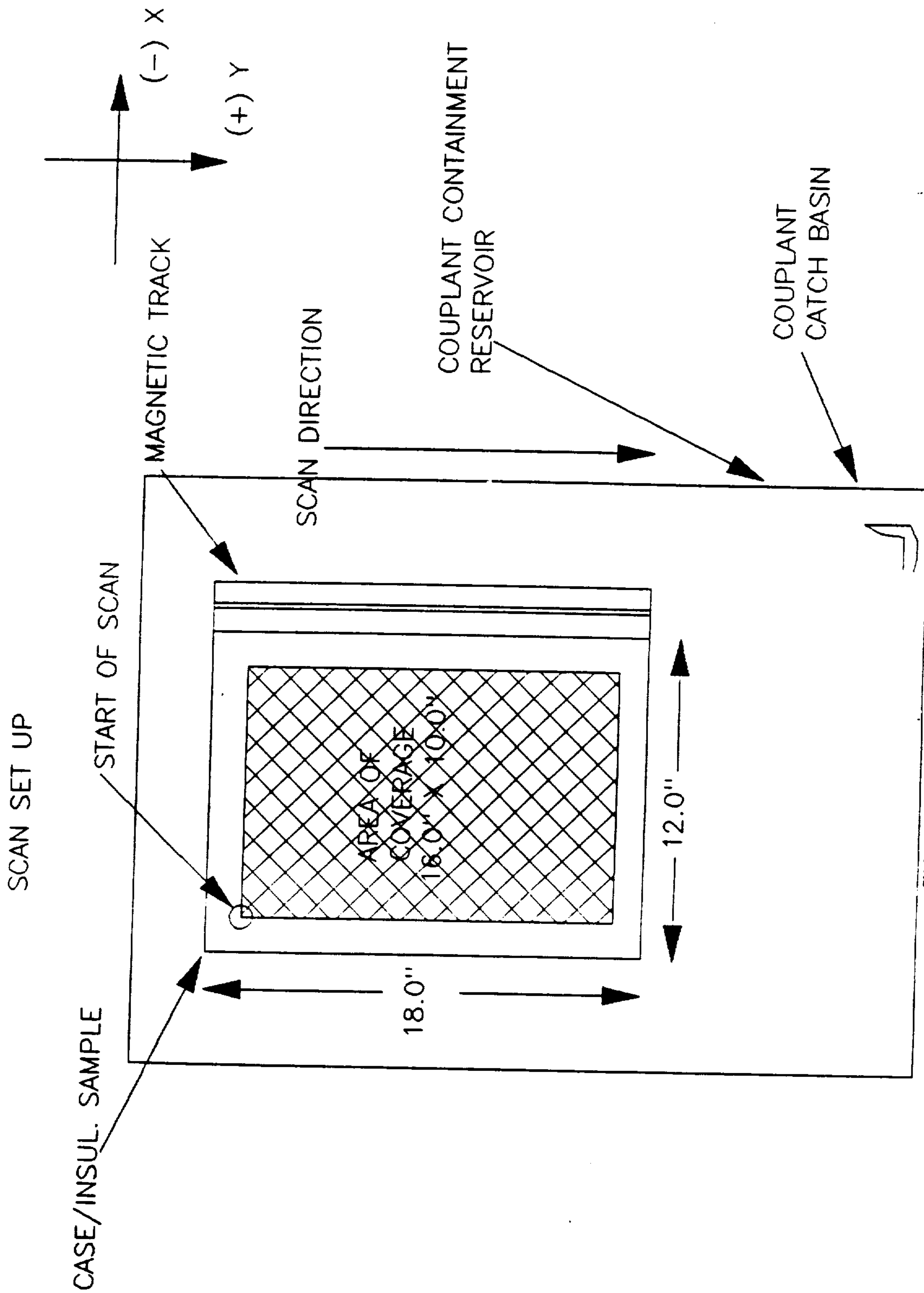

FIGURE 1

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B-356
B-357

DATA FILE INTEGRITY
VERIFICATION TEST

DATE: 23 May 89

OPERATOR: Brad Cushing

VERIFIED BY: 5/23/89

SOFTWARE VERSION NUMBER: 4.0

SYSTEM SERIAL NUMBER: SA51869

TRANSDUCER SERIAL NUMBER: RND-3

DATA TAPE SERIAL NUMBER: 5AE31C89A7

SECTION 1

1) COMPLETE THE FOLLOWING CHECK LIST BEFORE PERFORMING TEST.

	COMPLETED (INITIALS)
a) 5.0 MHZ TRANSDUCER IS BEING USED	BSC
b) 10.0 IN. LONG SCANNER ARM IS BEING USED	BSC
c) SAMPLING INCREMENT IS 0.10 IN.	BSC
d) SYSTEM IS IN RF MODE	BSC
e) A-SCAN GATE DELAY ~~9.0~~ 40.0 MICROSECONDS	BSC
f) A-SCAN GATE WIDTH ~~51.0~~ 26.0 MICROSECONDS	BSC
g) C-SCAN GATE DELAY ~~20.0~~ 47.25 MICROSECONDS	BSC
h) C-SCAN GATE WIDTH ~~30.0~~ 4.90 MICROSECONDS	BSC
i) SCAN WILL COVER AN AREA THAT IS ~~16.0~~ 10.5 IN. AXIALLY BY ~~10.0~~ 8.0 IN. CIRCUMFERENTIALLY	BSC
j) A NEW DATA TAPE HAS BEEN ACQUIRED	BSC
k) PRINTER IS CONFIGURED PROPERLY	BSC
l) NAME DATA FILE SET~~DIVT~~	BSC

2) PERFORM SCAN.

3) SAVE DATA TO HARD DISK.

4) HAS ALL DATA BEEN STORED PROPERLY TO HARD DISK?

CIRCLE ONE: YES NO

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, CHECK ALL CONNECTIONS, AND INFORMATION ON SET FORM, PROCEED TO STEP 4.

5) RE-PERFORM SCAN.

6) WAS RE-SCAN DATA PROPERLY SAVED AND RETRIEVABLE?

CIRCLE ONE: ~~YES~~ NO

IF YES, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, AND PROCEED TO STEP 6 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________

7) OBTAIN A HARD COPY OF THE C-SCAN, B-SCAN, AND SPECTRAL C-SCAN.

8) WAS ALL REQUIRED DATA PRESENT ON EACH HARD COPY PER AMDATA ENGINEERING SPECIFICATION NUMBER 870128, SECTION 10, AND APPENDIX O.

CIRCLE ONE: YES NO

IF YES, DO NOT DISCARD HARD COPY INFORMATION, PROCEED TO SECTION 2 OF THIS FORM.

IF NO, CHECK CONNECTIONS TO PRINTER, VERIFY THAT THE SYSTEM AND PRINTER ARE CONFIGURED PROPERLY.

9) OBTAIN C, B, SPECTRAL C-SCAN HARD COPIES.

10) WAS ALL REQUIRED DATA PRESENT.

CIRCLE ONE: YES NO

IF YES, NOTE IN SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM. DO NOT DISCARD THE HARD COPIES, PROCEED TO SECTION 2.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

SECTION 2

1) TRANSFER THE DATA FILES STORED ON THE HARD DISK TO TAPE.

2) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF THE TRANSFER WAS SUCCESSFUL, PROCEED TO STEP 5 OF THIS FORM.

IF THE TRANSFER WAS UNSUCCESSFUL, VERIFY THAT THE PROPER SEQUENCE OF STEPS WAS PERFORMED TO TRANSFER DATA FROM ONE MEDIA TO ANOTHER. CHECK CASSETTE TO VERIFY THAT THE "SAFE" SWITCH IS IN THE OFF POSITION, AND PROCEED TO STEP 3 OF THIS FORM.

3) PERFORM "DATA FILE TRANSFER" SEQUENCE AGAIN.

4) VERIFY THAT DATA FILES ARE ON THE TAPE.

IF TRANSFER WAS SUCCESSFUL, NOTE IN THE SPACE BELOW WHAT WAS DONE TO CORRECT THE PROBLEM, PROCEED TO STEP 5 OF THIS FORM.

IF NO, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

CORRECTIVE ACTION(S) ______________________________
____
____
____
____
____

5) TRANSFER DATA FILES FROM TAPE BACK TO HARD DISK AND VERIFY DATA FILES WERE SUCCESSFUL TRANSFERRED.

IF YES, PROCEED TO STEP 6 OF THIS FORM.

IF NO, PROCEED WITH STEPS 3 AND 4 OF THIS SECTION AGAIN, THIS TIME CONCERNING DATA FILE TRANSFER FROM TAPE TO DISK.

CORRECTIVE ACTION(S) ______________________________

6) PERFORM STEPS 6 THROUGH 9 OF SECTION 1 OF THIS FORM. MAKE COMMENTS CONCERNING DEVIATIONS DURING EXECUTION OF THE ABOVE SET OF INSTRUCTIONS IN THE SPACE BELOW.

COMMENTS ______________________________

7) COMPARE THE HARD COPIES OBTAINED FROM SECTION 1 OF THIS FORM AGAINST THE HARD COPIES OBTAINED FROM SECTION 2 OF THIS FORM.

8) WERE THE AMPLITUDE RESPONSES ON THE A AND C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN AMPLITUDE RESPONSE ______________________________

9) WERE THE PHASE RESPONSES ON THE A-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

DIFFERENCES IN PHASE RESPONSE ______

10) WERE THE FREQUENCY RESPONSES ON THE B, C, SPECTRAL C-SCANS THE SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IS SPACE BELOW.

DIFFERENCES IN FREQUENCY RESPONSE ______

11) WERE THE COLOR SCALES AND DISPLAY CLARITY SAME?

CIRCLE ONE: YES NO

IF NO, MAKE COMMENTS NOTING DIFFERENCES IN SPACE BELOW.

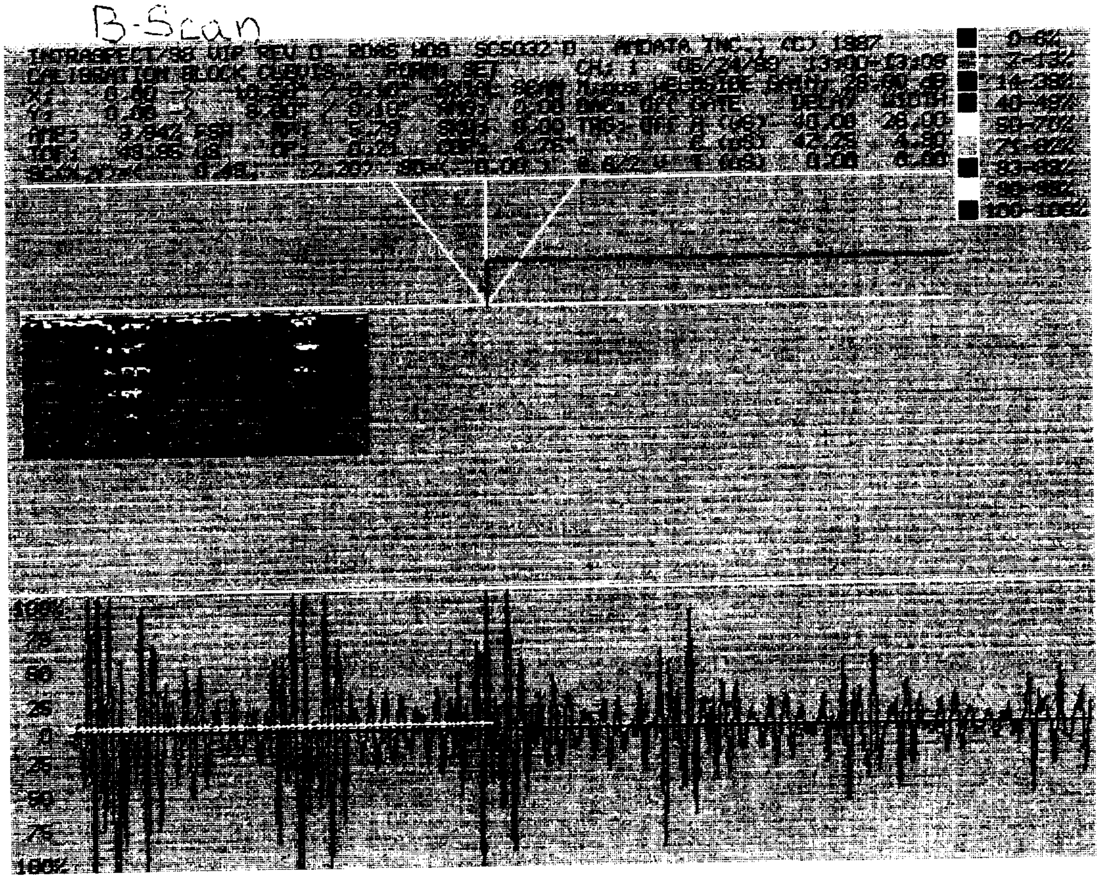
DIFFERENCES IN COLOR SCALE AND DISPLAY CLARITY ______

***NOTE: IF THE HARD COPIES OBTAINED FROM SECTION 1 DO NOT MATCH THE HARD COPIES FROM SECTION 2, THERE WAS A COMPROMISE IN DATA FILE INTEGRITY DURING TRANSFER. ASSEMBLE ALL HARD COPIES TOGETHER, ATTACH TO THIS FORM, COMPLETE A PROBLEM/FAILURE REPORT, FORM N, AND NOTIFY MTI ELECTRONIC MAINTENANCE.

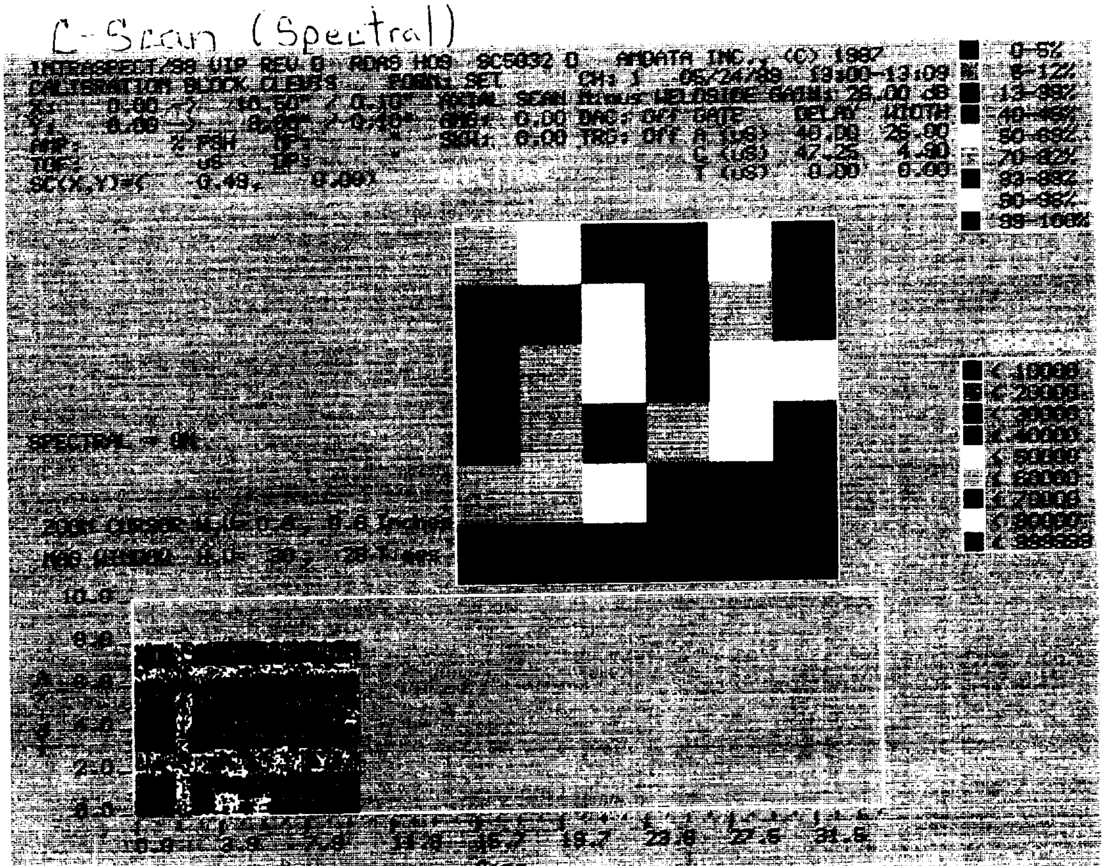
Data File Integrity

ORIGINAL PAGE
COLOR PHOTOGRAPH

B-Scan

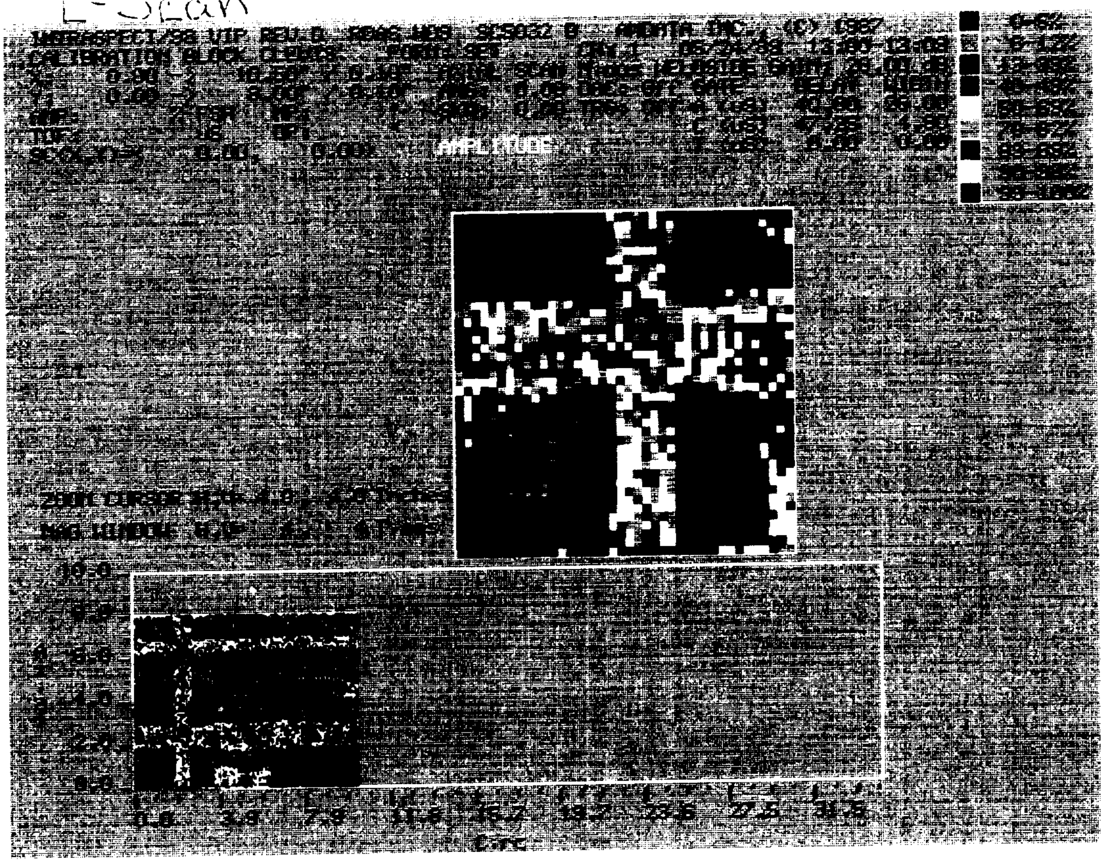


C-Scan (Spectral)



Data File Integrity

C-Scan



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press <SHIFT>+<RECALL> for a menu

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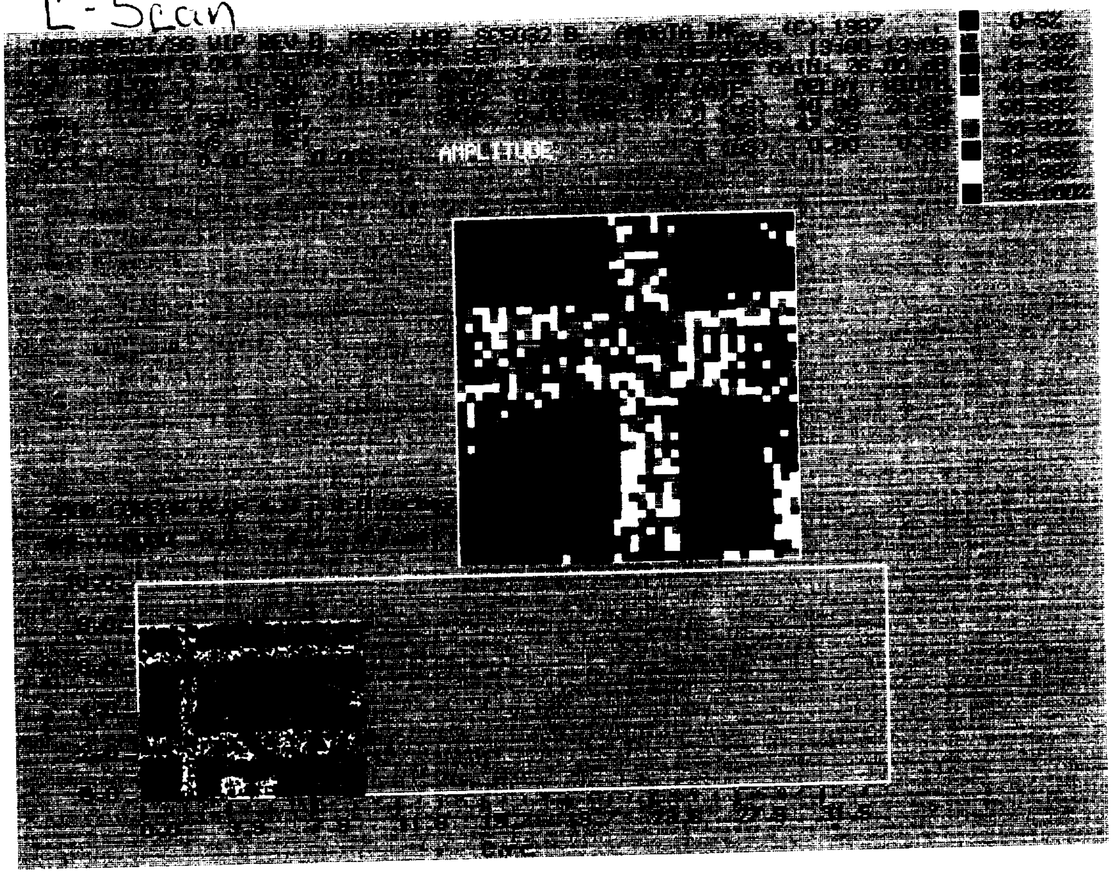
Data File Integrity (From data tape)

C-Scan



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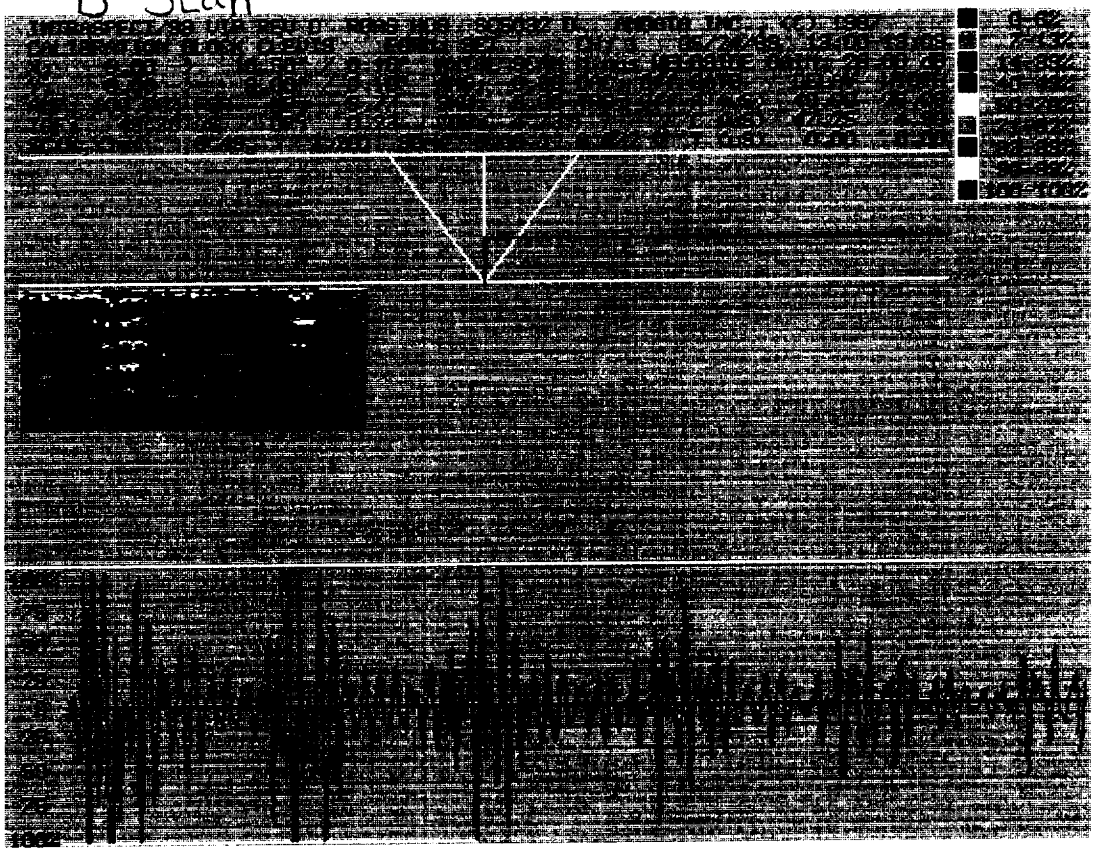
Data File Integrity (From Data Tape)

B-Scan



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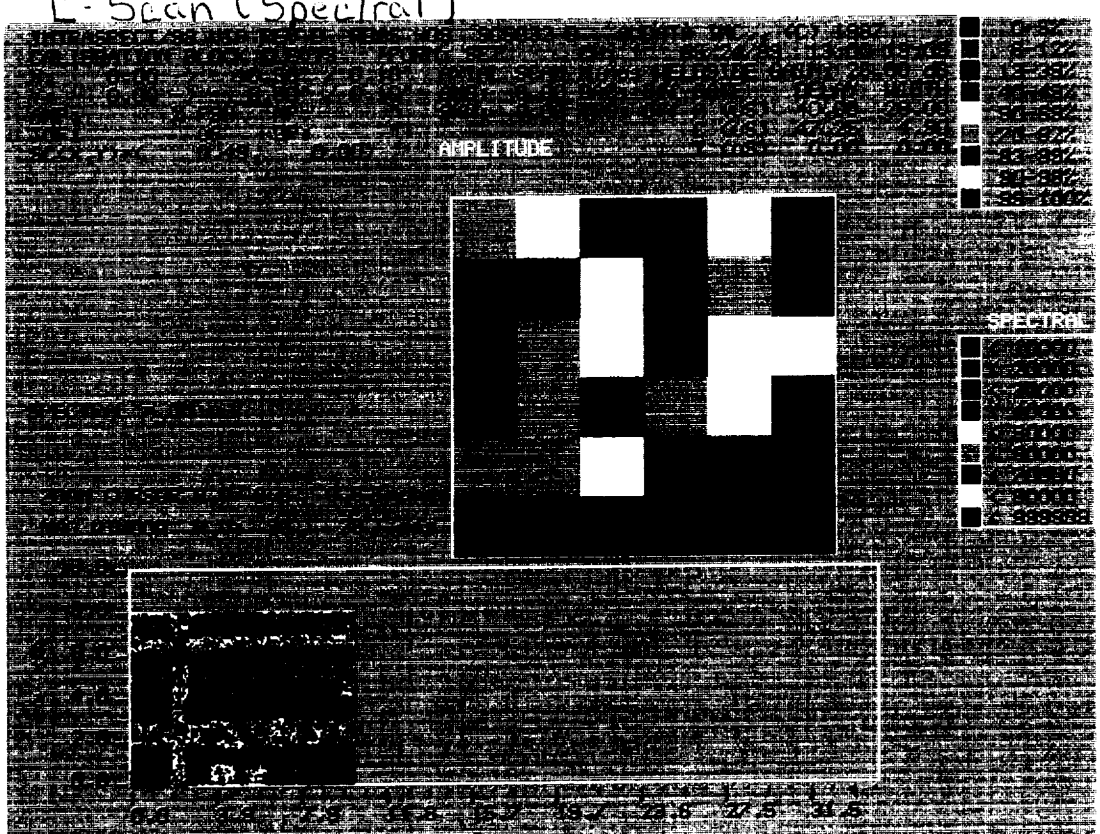

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SCAN SET UP

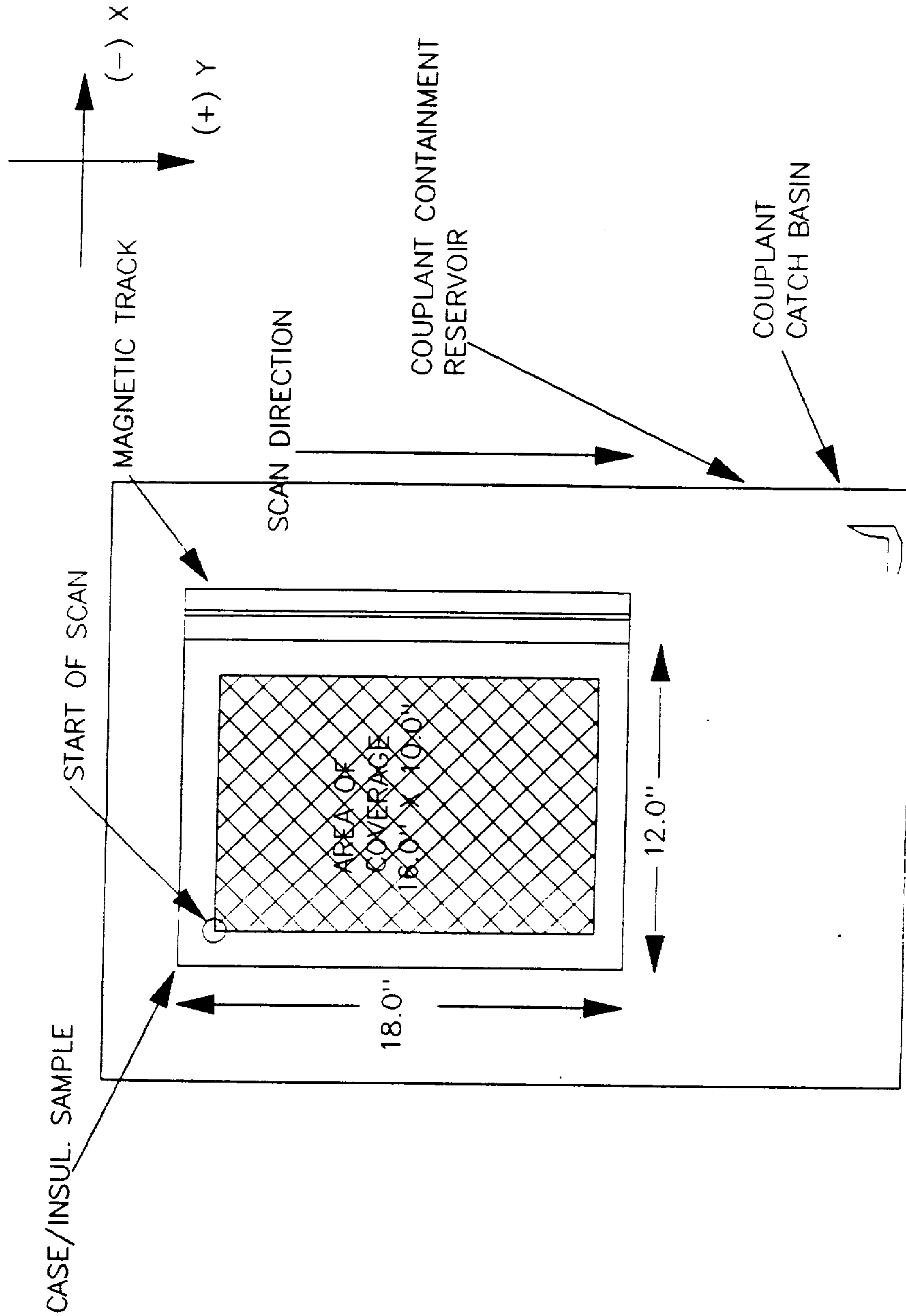

FIGURE 1

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B-372
B-373

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G. Lebaron	1	L10
M. Martersteck	1	811
D. Noble	1	THI-711 (KSC)
R. Papasian	45	E05
H. Reed	1	882
P. Reed	1	L34
D. Ruths	1	E06
K. Sanofsky	1	851
J. Sutton	1	L10
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Data Management	5	L23E